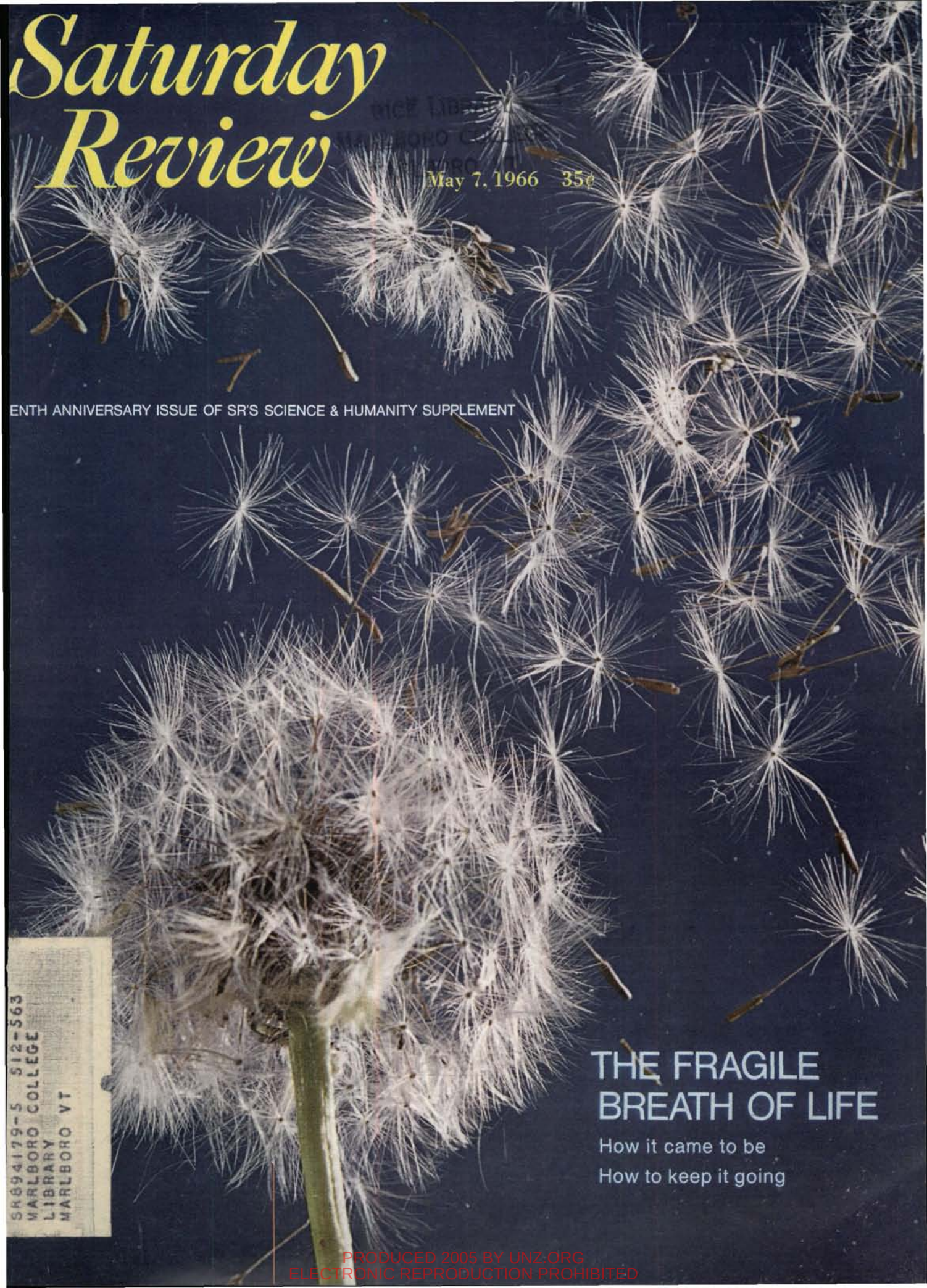
Saturday Review
May 7, 1966 35¢
ENTH ANNIVERSARY ISSUE OF SR'S SCIENCE & HUMANITY SUPPLEMENT
THE FRAGILE BREATH OF LIFE
How it came to be
How to keep it going

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—at $14,667 or at $5,447.*

S.S. Independence of the American Export Isbrandtsen Lines just before departure on a Sunlane Cruise to the Mediterranean.

*Manufacturer's suggested retail price for the Continental Coupé shown above; includes power steering, power windows, power brakes, power seat, plus many other luxury and safety features, but exclu destination charges ($19 at Detroit, higher at more distant points), optional equipment such as whitewall tires ($57) and state and local taxes. The Lincoln Continental limousine is custom-crafted Lehmann-Peterson, Coachbuilders, Chicago, whose suggested retail prices start at about $14,667. Your Lincoln Continental dealer will be pleased to provide you with full pricing and ordering deta

A Lincoln Continental, at $14,667 or at $5,447, distinguishes you among fine car owners. It i the luxury motorcar that stands apart from all other cars in styling, performance, value—an as an expression of individuality, good taste, accomplishment. Come take a closer look: driv it, experience it, and discover for yourself how close you may be to owning a Continenta

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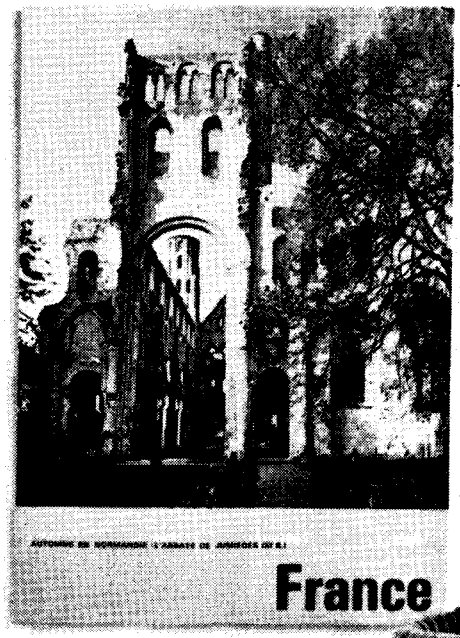

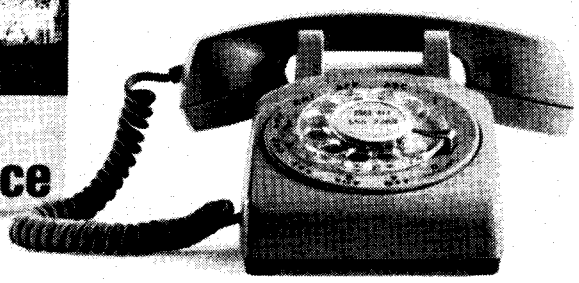

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(*Advertisement*)

The hands-down, thumbs-up winner of my award for nuttiest title of the year is Lorna Novak's *How Amelia Secured The Tie That Binds With A Very Loose Knot* (hereinafter referred to as *HASTTTBWAVLK*).

Obviously, with a title like *HASTTTBWAVLK*, one has to read the book, if one has enough energy left after reading the title. I did. *HASTTTBWAVLK* could probably be best described as a woman's novel . . . with no segregation intended. It's just that it is filled with observations about things that women are somewhat better equipped to handle than men. Items such as babies, bridge games, girdles, and ploys for outwitting husbands. The plot, to be sure, is shorter than the title: marry off niece. It takes Amelia 237 pages to do it, and of course, she is about as adept at securing the tie that binds as I am at securing diapers. Though her machinations go for naught, while Nature takes over, it's fun to watch Amelia operate.

As is anyone who meddles, Amelia is full of advice:

On marriage: *It's a 50-50 proposition. The first day you feel your husband has had his 50 per cent, get yours.*

On mothers: *Mothers are better off in the Argentine. Even then, their letters give you the same queasy feeling as unopened Neiman Marcus bills.*

Author Lorna Novak sets her novel in Smedley, Texas, which must be somewhere near the setting her previous novel—*Does It Make Into A Bed?* Mrs. Novak is well-disposed to write about Texas because she lives there herself with a husband and three children. Somehow, you get the feeling that Lorna and Amelia are intimates.

How Amelia et cetera not only has an outrageous title, it is a worthwhile reading experience. Ask your bookseller for *HASTTTBWAVLK*, but take a deep breath first.

L. L. Day

EDITOR-AT-LARGE

HASTTTBWAVLK ($4.50), by Lorna Novak, is published by Doubleday & Company, Inc., 277 Park Avenue, New York 10017. Copies may be obtained from your own bookseller or at one of the 32 Doubleday Book Shops, one of which is located at 1411 Commerce Street, Dallas, Texas 75225.

Saturday Review

May 7, 1966

Cover photo by Grant Heilman

SR: Ideas

29 The Fragile Breath of Life: Tenth Anniversary Issue of *SR*'s Science and Humanity Supplement, with articles by Lloyd V. Berkner and Lauriston C. Marshall, Roger Revelle, LaMont C. Cole, J. R. Porter, Solomon Garb, Leland J. Haworth, Robert M. White, Walter Orr Roberts, Frederick Seitz, George K. Davis, Barry Commoner, John Lear, Jean Corwith

42 The Third Culture: An Editorial

73 Fifty Years of Pulitzer Prizes, by John Hohenberg

SR: Books

87 Literary Horizons, by Granville Hicks

87 Index of books reviewed

SR: Departments

4 First of the Month, by Cleveland Amory

8 Top of My Head, by Goodman Ace

10 Phoenix Nest, by Martin Levin

12 Chess Corner, by Al Horowitz

14 Trade Winds, by Jerome Beatty, Jr.

22 Manner of Speaking, by John Ciardi

43 Letters to the Editor

79 Booked for Travel, by Horace Sutton and Stanley Karnow

85 Music to My Ears: Irving Kolodin

86 *SR* Recommends

88 Literary Crypt

100 *SR* Goes to the Movies: Hollis Alpert

101 Broadway Postscript: Henry Hewes

101 Literary I.Q.

102 TV-Radio: Robert Lewis Shayon

110 Kingsley Double-Crostic No. 1674

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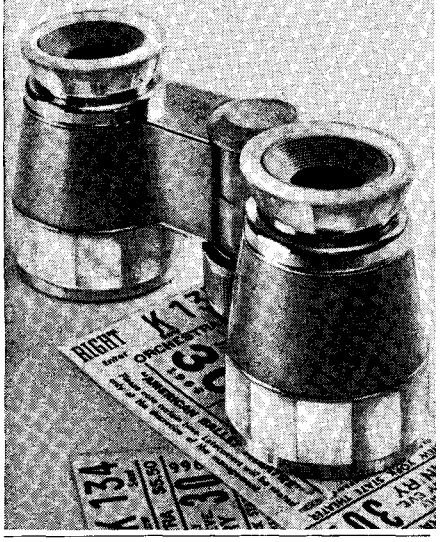

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— PUBLISHERS' WEEKLY

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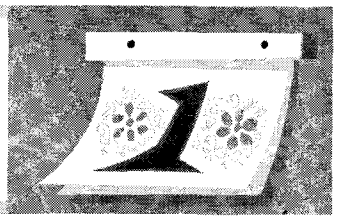
First of the Month



By CLEVELAND AMORY

APRIL WAS the month of Ky and Thi, of Thien Minh and Tri Quang, of Buddhists and bombing—and if you didn't know by the end of the month which was which, you knew at least which was Thich. It was also the month, however, of LBJ and LSD, of Nicklaus and Nader, of Julie Christie and Lee Marvin, of Save the Met and See the Mets.

• • •

Ralph Nader was not only the Man of the Month, he was also the symbol of the one against the many, the little guy against Big Business, the individual against corporate—and corpulent—conformity. And with a steady stream of cars apparently flowing back to Detroit under an assembly line of errors—Chevvys for doors and throttles, Chryslers for "creepage," and Fords for brake linings—it hardly helped for Henry Ford to come front and center and offer Mr. Nader a job as a rear axle engineer. "If you start by law to fool around with model changes," said Mr. Ford, "you upset the whole cycle of the industry." Well, frankly, it's just what we've always said. Sow the wind and reap, if not the cyclone, at least the cycle.

• • •

Elsewhere on the auto—or ought not to—front, we had occasion to be called by a fellow worker for the Humane Society of the U.S. to come to the International Automobile Show in New York where a lion was, we were told, being mistreated. When we arrived we discovered that the lion had been involved in—shall we say—an involved promotion which included the biting of a ribbon for a simulated opening of the show. The lion was obviously the worse for wear, and we told George Sabo of Amenia, New York, who owned the lion, to put it back in its cage. A few moments later, however, a television cameraman, aided by Mr. Sabo, was actually in the cage photographing the lion—who was again being plagued by a stick with a nail at the end of it. And, in the end, as you probably know by now, the lion, surprised by a camera right in its face, seriously bit a twenty-two-year-old model named Nell Theobald.

Fortunately, Miss Theobald, after surgery, is recovering nicely. As for the lion, first sold to the Tote-'em-In Zoo in Wilmington, North Carolina, it was, at the end of the month, so famous an attraction that it was swapped to the West Virginia Zoo for a monkey, a bear and a baby llama. The moral of the story? None, except to report to you that, judging from our mail, 95 per cent of the American public is extremely weary of stupid and/or cruel wild animal promotions.

• • •

Our favorite story of the month concerned the government's trying to buy back some bombs we had sold to Germany after World War II. (Well, look at it this way, we tried not to sell them *during* the war.) Anyway, the government, which had sold these bombs to the Germans for $1.70 apiece, is now trying to buy them back to drop on Vietnam for $21 apiece. At that rate a couple of years from now we'll be buying them back, at my figuring, for $252 apiece to drop somewhere else.

But if our government's going to be that money-happy, there may be an idea here for getting some of our own depressed cities and towns and villages back on their feet. You know all those Civil War cannon you see in village squares with all those cannon balls? Well, if World War II bombs go up more than 1,000 per cent in value, those Civil War balls ought to be a doggone gold mine.

• • •

On one hand during the month, we had the "Death of God." On the other, we had a "Goddess of Sloppiness." Or so *Mademoiselle* magazine described the Oscar-winner, Miss Christie. Well, we have had the Love Goddess and the Girl Next Door. Look at it this way. At least they're getting closer to home.

The TV commercials during the month certainly went democratic. First we had a glamorous yachting scene, and then we learned that those yachtsmen and yachtsladies weren't the glamorous people we had thought they were at all. They were, the ad told us, "The Metre-

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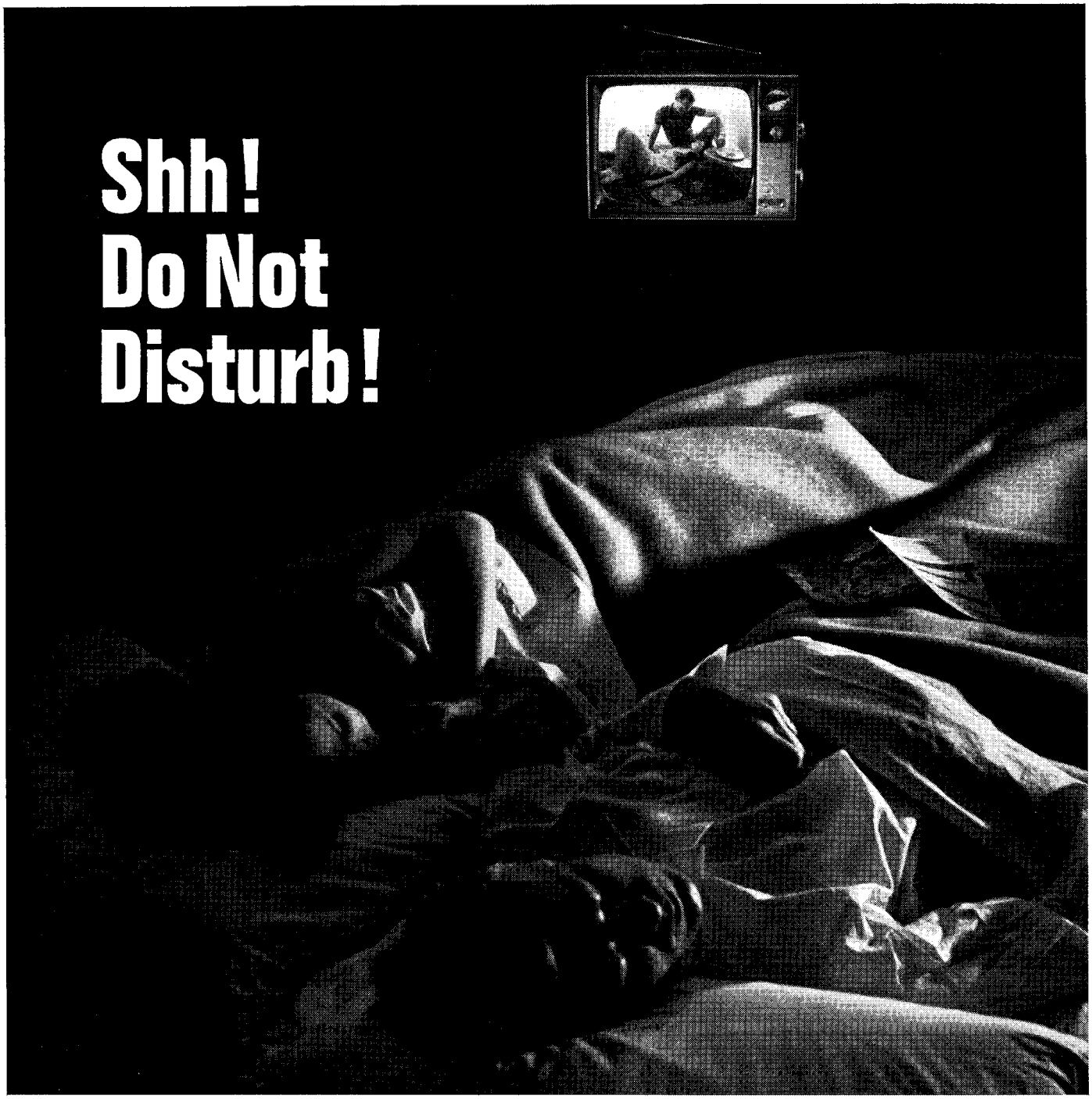
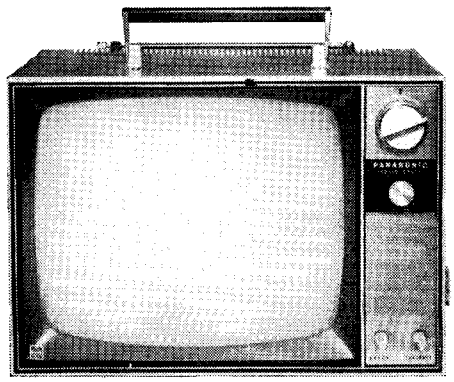


In Just 2½ Minutes, This Panasonic TV Set Will Go To Sleep By Itself

Both of you have fallen asleep with the TV set on, but who cares. This dreamy set turns off its light and goes to bed, too. Just set its bedtime when you set its channel. Get yourself nice and cosy, and stay that way. Then, if you fall asleep before the program is over, only the sponsor will care. Your Panasonic TV will go to sleep by itself very soon, too.

Panasonic TR-120 12″ solid state TV, electric or battery, with built-in timer that you set for up to a full hour—and TV turns itself off automatically. Super-powerful circuitry provides brilliantly clear and steady picture, which comes on with sound, as soon as set is turned on. Cabinet of beautiful wood-grain finish. Only $149.95*



PANASONIC
BY MATSUSHITA ELECTRIC

*Price slightly higher in Canada

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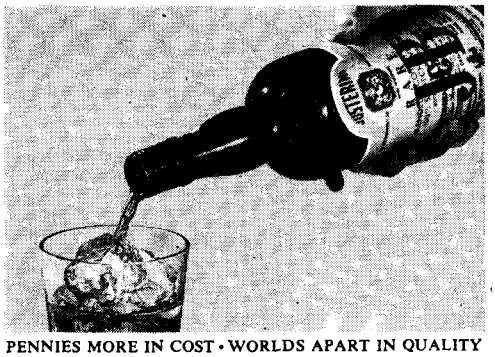
Oh, if you could only taste words!

(Then J&B's job would be much easier)

Basically J&B has achieved its unique position because it is an exceptional blend of many scotch whiskies. These have been "married" in J&B to produce a different and delightful and quite special flavour. Like any flavour, it is difficult, if not impossible, to describe. It must be experienced . . . *and you're invited.*

J&B is produced by the venerable firm of Justerini & Brooks, founded 1749, which guards its unique quality with fierce British determination. Justerini & Brooks has numbered many of the great and near-great among its patrons, including the immortal Charles Dickens.



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cal for Lunch Bunch." Then we came to a cola commercial. The Jet Set? Perish the thought. They were, the ad said, "The Wet Set."

• • •

And speaking of ads, we read the other day an interesting advertisement for *Glamour* magazine. "The Young Take Over," the ad declared. "It's the Great Take-Over, all over the world."

And, as if that weren't bad enough, the ad went on: "Today's Young People outnumber, outdo, outvote, out-travel and out-buy all other consumer groups."

Gosh, that's sure a lot of outs, isn't it—for all those people who are always trying to tell us what's in. The ad wasn't through yet. "They are," it went on, restyling fashion. They're rewriting etiquette. They're recasting beauty – in their own young image."

Recasting beauty! And in their own image! Oh, come on. These kids must be kidding. Anyway the ad finally concluded with some sober news. "They are," it said reverently, "the Social Dictators of our times."

So there it is, the Great Take-Over, all over the world—complete with social dictators! Well, we've always said know your enemy—and now we see how right we were. There we were, lulled all this time into false security—thinking all we had to worry about were the Russians and the Chinese and all our enemies all over the world, and all the time we had *these* bozoes, right, so to speak, in our own backyards.

And wouldn't you know they'd strike just when we were overextended—with more than 200,000 of our fighting men halfway across the globe. Well, darn it, it's no time to pity ourselves. What we've got to do is come up with some ideas and see what can be done. One idea we have is to infiltrate them. Send in young-looking old people – old beauties who look young. Old thinkers who think young.

Start a revolution. Pick the social dictator among them who most leans our way (some of them must like *something* about our way of life) and, well, frankly, buy him.

Finally, when we've set up a *friendly* dictatorship among them, everything will be all right. Oh, we know dictatorships aren't *our* way of life, but they *can* be benevolent. And, if we can't deal with them, then we must go all out—and overturn them. That's right, take the whole kit and kaboodle of them—their sports cars, their motorcycles, their skate boards, their bangs and even their boots—and overturn 'em.

It may demand sacrifices on our part. And it may take time. But look at it this way, old-timer. This is one time when time is on our side.

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Why is the owner of this Rover 2000 smiling?

Because he's alive.

This Rover 2000 Sports Sedan was photographed just after a head-on collision with a truck.

With virtually any other make of car, certain things tend to happen in these dire circumstances, among them: a) The engine tries to join you in the front seat; b) The steering column, which on most cars begins near the front wheels, competes with your chest.

Neither of these happened to the driver of this Rover 2000. (If you are wondering what *did* happen, he cracked a collar bone and two ribs because his safety harness was carelessly loose.)

Luck Had Little To Do

Luck had very little to do with it; the answer is in the car itself.

First off, the Rover 2000 is designed with the thought that, on collision, an engine ought to go down *under* a car rather than up into your lap.

Also, the forward section of the body is designed to crumple defensively; an expensive shock-absorber, but well worth it. Note that although the front lost 18 inches, the passenger compartment is intact.

Steering Column Has To Go

As to the lost 18 inches; in the ordinary car a foot-and-a-half of steering column has to go *somewhere.* The 2000's steering column begins behind the engine, and thus is not accident-prone. Moreover, the steering wheel is flexible and shock-absorbent.

The seats, front and back, are bucket seats of molded steel covered by fine padded leather. The tops of the front seats are padded, as well, to protect them from the faces of the rear passengers.

The top of the dash and the storage bins in front of your knees are also padded. Objects that are necessarily hard are carefully located and inoffensively shaped.

The Rover 2000 Sports Sedan is thought by many authorities to be the safest car in the world. Happily, it is also among the best handling, so that the likelihood of accident is far less to begin with, and it is fun to drive.

In addition to a revolutionary suspension system which makes for fantastic maneuverability, the 2000 also has disc brakes all around.

Heartless To Pretend . . .

In conclusion, may we apologize for mentioning such unpleasant possibilities? However, it is even more heartless to pretend that they don't exist—and neglect to provide for them.

The stern fact is that very few cars have *any* of the safety features we have mentioned; and only the 2000 has all of them—and a good many more besides.

Oh, yes, the price: $3998. Or you can buy it for delivery in Europe and save enough to pay for your passage. If you write, we'll tell you about that, too. Thank you.

The Rover Motor Co. of N. America Ltd., Chrysler Bldg., New York

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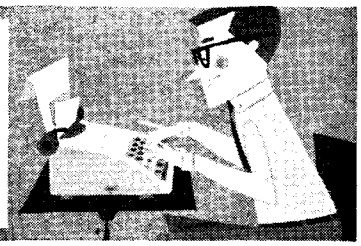
Top of My Head



Figures of Fun

THE TWO current easiest targets for columnists to have fun with are Vice President Humphrey, and Television.

Every columnist worth his scalpel got a lot of mixed-metaphor yardage out of the President's sending in his relief pitcher, Hoyt Humphrey, to throw out the first ball at the opening Washington Senators game. It was a natural setup for snide comment because everybody knows the President has been playing ball with the Senators for years.

Then the television business made itself a figure of fun when the chairman of the Federal Communications Commission addressed the broadcasters in assembly in New York and spoke not a word about the lousy programs, but made a speech about cigarette smoking, stating that the networks have been lax in warning the public about the hazards of cigarette smoking.

I suppose he was referring to smoking in bed while watching television. Because the programs can put you to sleep and sleeping in bed with a lighted cigarette can cause all sorts of hazards. Like fires and sinus congestion. Which can develop into commercials for Allstate and Dristan.

But the story of this unusual speech by Mr. E. William Henry at such a crisis time in network broadcasting had a typical E. Henry finish. A week or so later Mr. E. Henry resigned from the FCC. This was quite a different Mr. Henry from the one who had begun so courageously just a year or so ago and in a speech to the broadcasters had said that television was a worse wasteland than it had been four years ago when his predecessor, Newton Minow, had given it that widely publicized tag.

The papers hinted there was some behind-the-scenes sculduggery. One of the papers hinted that the President, acutely sensitive to his family's interests in Texas broadcasting, had phoned Mr. Henry. "According to a broadcasting industry source," the *Herald Tribune* story hinted, "Mr. Johnson telephoned the FCC chairman the following day and said, 'Bill, I want you to lay off that wasteland stuff.'"

With that subtle hint in mind Mr. E. William Henry's farewell address to his troops was about cigarette smoking. But where there's smoke there's fire. And when the smoke cleared, Mr. Henry, who began so bravely, cleared out, leaving behind scads of network program vice presidents, their prime time untouched, their indifference untarnished and most of all, their brains unwashed—all smoking cigarettes furiously as they wait for the next Nielsen report.

BUT there's little chance of hazard. Network executives will not fall asleep while smoking. Network planners sleep very little these nights. And you wouldn't either if you knew that every time you film a pilot of a new half-hour program it's going to cost you $200,000. And every time you film an hour pilot it costs $400,000. A hundred or so pilots are filmed every year. Only about thirty new programs are selected each year. The rest go down the drain. The rest, in this case, cost the three networks about $50,000,000 a year.

Some time ago I was talking to the network vice president in charge of spending $200,000 for a half-hour pilot. He told me between puffs what it costs the networks to film all these pilots. In all my profound wisdom I said to him: "There's not much going on in television during the summer. Instead of filming a pilot why don't you sell a half hour's time to a sponsor for a one-shot and while it's on the air make a tape of it? That way the pilot costs you absolutely nothing and besides you sell a half hour's time."

"Oh, we can't do that," he said biting into his filter.

"Why not?" I asked.

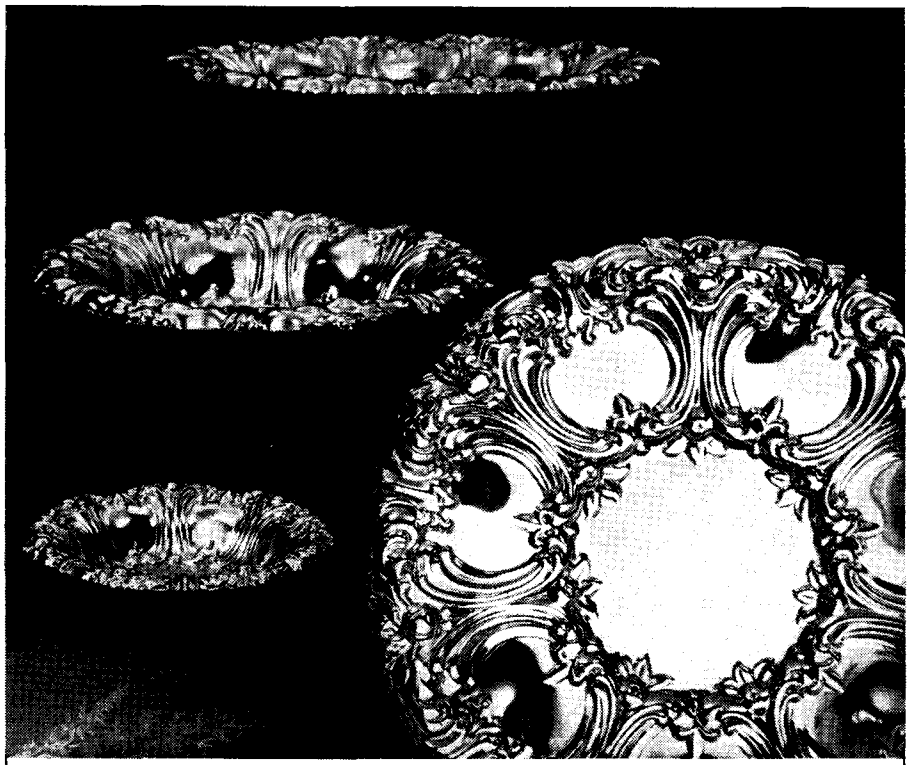
He turned to his network colleague and said: "Why can't we do that?"

"I don't know," the other answered, nervously putting out his cigarette, "but it doesn't sound right to me."

Maybe the FCC will find the answer to this. It is hoped the President's next appointee to the chairmanship will take up where Newton Minow left off and give the problem careful study. Several cartons and many packs later he may come up with the answer to this financial morass in which the networks are mired.

Unless of course the new chairman is beset by a big fish and he, like Mr. E. William Henry, finds himself a little minnow in a big pond.

—GOODMAN ACE.



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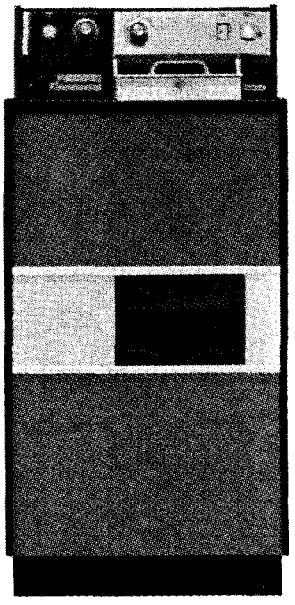

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Current Events

Edited by Martin Levin

The Expertise of Sisyphus

Sisyphus, public relations man
For a mountainside resort,
Did what a top flight expert can
To earn a good report.

Seemingly straining sinew and soul
To push a stone toward the top
He made crowds gasp when he lost control
And let that huge stone drop.

Sisyphus, public relations man,
Held that a task unfinished
Within the public's attention span
Keeps interest undiminished.

—Elias Lieberman.

Ivanov

A COMPARATIVELY little known play by Anton Chekhov *Ivanov* has begun a limited run on Broadway, with John Gielgud and Vivian Leigh as stars. The play's dramatic and literary merits, compared to the rest of Chekhov's output, are pale. Yet it should be of interest to every admirer of the writer, for to a considerable degree the play is autobiographical.

Ivanov deals with a mixed marriage, that of a Russian country gentleman to a Jewess. The play was written in 1877 for the then famous Korsch theater in Moscow, at a time when it took real courage to write on a subject that no Russian author dared to touch.

It has come to light in a few hitherto unknown letters by Chekhov recently published in Moscow that Chekhov had actually courted and almost married a Jewish girl. The romance was a well-hidden secret of Chekhov's life: Chekhov had insisted that his Jewish girl friend renounce her religion and adopt the Greek-Orthodox faith. Czarist Russia did not recognize civil marriages, so it was a matter of Chekhov's becoming a Jew and losing all his privileges and his status: or the girl's becoming a Christian and bringing legitimate children into Chekhov's Russian world. Only revolutionaries lived in sin and produced bastards. Chekhov was never a revolutionary and he was not interested in defying the laws. The girl refused to become a Greek Orthodox, and the engagement was broken in 1886. A year later came *Ivanov*. It was an attempt by Chekhov to play out what might have happened had he married his fiancée.

Chekhov's vision of life with a Jewish wife was bleak indeed. Ivanov's marriage to Anna, nee Sarah, was a disaster. It went on the rocks within five years. Ivanov quickly tired of her. She remained madly in love with him. Chekhov was a modest and humble man, but not modest and humble enough to assume that his presumptive wife, especially a Jewish one, would tire of him before he tired of her.

Anna-Sarah became desperately ill with tuberculosis. Her only salvation was in balmy Crimea but she would not go there alone. And Ivanov would not go there with her; he claimed lack of

money. He began to frequent the house of his neighbors, the Lebedevs. Their twenty-year-old daughter Sasha and Ivanov fall in love. Ivanov is constantly reproaching himself in the best Russian style. In one scene when Anna's complaints and accusations become especially exasperating, Ivanov loses his composure and shouts: "Shut up, you *Zhidovka*!" *Zhidovka* is as vicious an epithet for a Jewess as there is in the Russian language.

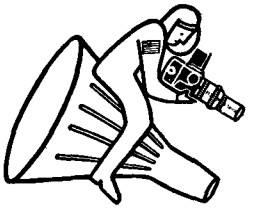
Anna, nee Sarah, dies of tuberculosis aggravated by suffering and anguish. Ivanov shoots himself in the last scene of the last act, on the day of his wedding to Sasha. Twice Chekhov changed the ending of his play until he found a solution appropriate, he thought, to a mixed marriage. —M. K. Argus.

Against the Migraine

It is assumed our Irish setter
O'Harrigan, likes nothing better
Than to be patted, night and day,
By everyone who comes his way—
For people have a theory that
Every pet adores a pat.

And yet there must be moments
when
Dogs have the megrims,
as do men,—
When they endure with mute
distress
The thumping cranial caress
And bending low the patted head
Would like an aspirin instead.

—Weare Holbrook.



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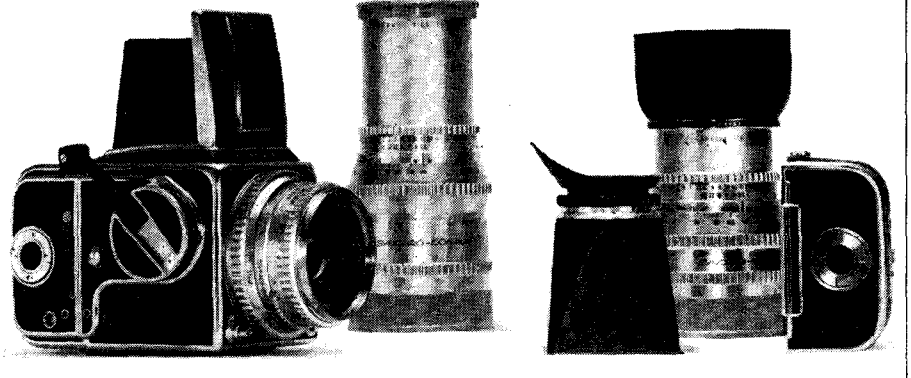

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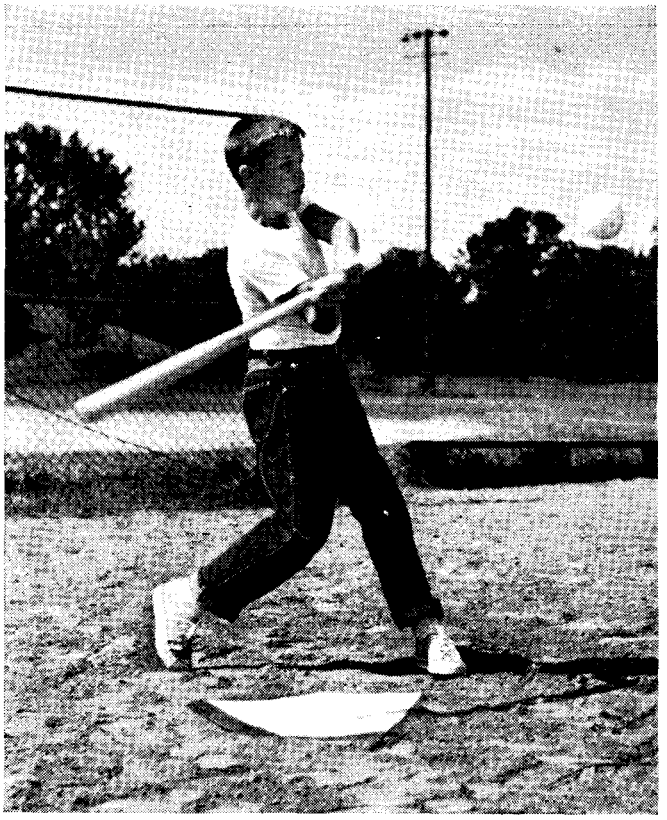
What's his total of "meals batted in"?



Like armies, little leaguers travel on their stomachs. How well he plays could depend on how well he eats.

Summer's flood of activities can play havoc with your family's eating habits. With irregular schedules and on-the-run eating, it's good to know that you can help bring even "sketchy" summer meals into better nutritional balance with milk and other dairy foods.

To make sure you're giving your family the nourishing meals they need to help keep them fit for summer fun, plan each meal around the Basic Four Food Groups. All the known nutrients are in the Basic Four and they provide a foundation for a balanced diet. The groups are: (1) Milk and Dairy Foods; (2) Meats, Fish, Poultry, Eggs; (3) Fruits and Vegetables; (4) Cereals and Breads.

You can put new flavor excitement into every meal with mouthwatering combinations using these Basic Four Food Groups. The variations are endless. Complete details are given in the booklet, "Family Feeding For Fitness And Fun." A free copy is yours for the asking. See offer at right.

Time to set up your own Family Fitness Program

Well-balanced meals are just one of the essential elements in keeping your family fit and healthy. Your family also needs adequate exercise and plenty of rest. You see, fitness means an ability to work with vigor and pleasure, without undue fatigue, with energy left for enjoying hobbies and recreational activities.

For information on how to set up your own family fitness program, write to the President's Council on Physical Fitness, Room 1031, GAO Building, 441 G Street, NW., Washington, D.C. 20203.

For your FREE copy of "Family Feeding For Fitness And Fun," write to the Public Relations Department, American Dairy Association, 20 N. Wacker Drive, Chicago, Illinois 60606.

a message from dairy farmer members of

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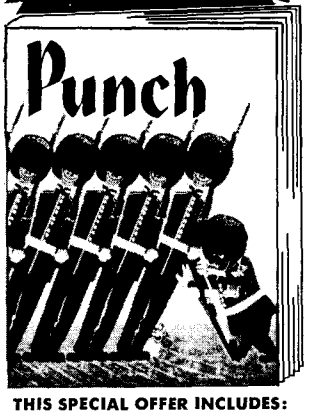

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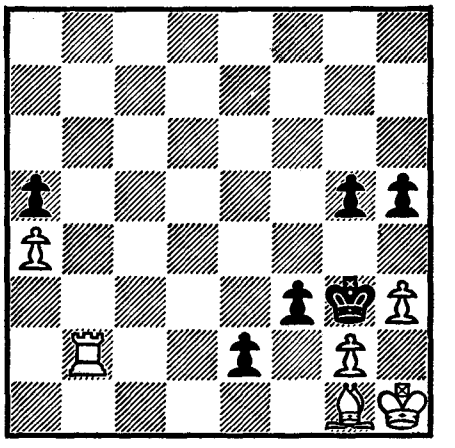
Chess Corner—No. 101

THE DIAGRAM is a setting for an end game composed by G. M. Kasparyan. White is to play and win. This one could very well have come up in actual play.



Though White is two pieces ahead, Black threatens 1 . . . PxP mate as well as 1 . . . P-K8/Q.

It appears that Black's threats are more potent than White's plus in material. On an open board, however, a Bishop may prove to be more powerful than a Queen.

Here is how it is done:

1 B-R2ch K-R5

Not 1 . . . K-B7 2 PxP, and Black is helpless since his Pawn at K7, being pinned, cannot move.

2 RxP PxR
3 B-B7! .....

Paradoxical; it forces Black to Queen with check.

3 ..... P-K8/Qch
If 3 . . . P-N5 4 BxP wins.
4 K-R2 .....

White has another threat: 5 P-N3ch. Black makes the only move.

4 ..... Q-B7

Now White's Pawn at N2 is immobilized.

5 B-Q6! .....

Black is in Zugzwang—compelled to move against his will. Otherwise, he might survive.

5 .... Q-B5ch
6 P-N3ch QxPch
7 BxQ mate

The final setting is an elegant example of the triumph of the spiritual over the material, illustrating that a Bishop on the right track is superior to a Queen that is derailed. —Al Horowitz.

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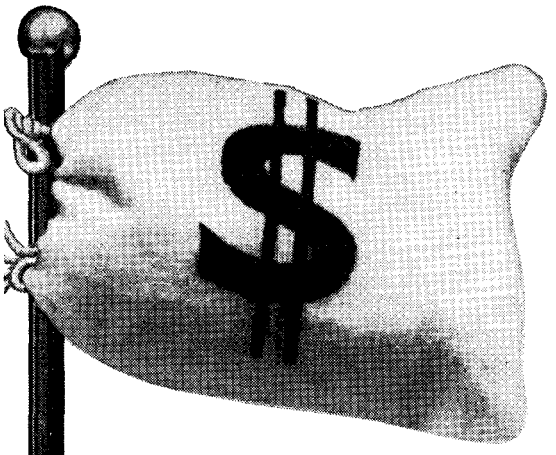

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How many of us share the uneasy feeling that we *are* somehow pledged to the dollar sign? Doesn't Capitalism mean much more? Why does even the American ship of state, laden with prosperity and freedom, seem to fly the dollar ensign as it sails through today's critical waters of *totalitarian ideologies, awakening nationalisms,* and a poverty-plagued humanity? Why is Capitalism a "nasty word" to many? Why do we find ourselves defending — even apologizing for — this complex thing called Capitalism?

Are we citizens of Capitalistic countries then pledged to acquisitiveness and affluence? Get**ism?** Gimme**ism?** Keep**ism?** Are we gorging ourselves at Capitalism's last banquet? Or, are we just beginning to savor Capitalism's grand feast of *BOTH* dollars *AND* freedom — for all? Isn't this what we are really pledged to?

That the exciting and relatively short-lived economic-social experiment of Capitalism *has succeeded* for many is beyond question. That it *will continue to succeed* for them and for more in the world of tomorrow, is beyond our knowing. That it *CAN succeed,* states Dr. Spencer D. Pollard, *is beyond doubt* — IF we *don't* let it limp along or toss it away.

That's precisely why we think *you* — and every American opinion-molder — should read Dr. Pollard's *new and transcendingly important* book: HOW CAPITALISM CAN SUCCEED. And *that* is why the publisher extends this extraordinary invitation . . .

If you will agree merely to read HOW CAPITALISM CAN SUCCEED, a complimentary-preview Guest Copy will be sent to you posthaste, without the least purchase obligation. (Of course, if you should want to add this important volume to your library, you may opt to buy it.) After reading the book, at your leisure, you simply return it at our expense. The publisher offers this accommodation in the sincere belief that you will, at the very least, find HOW CAPITALISM CAN SUCCEED worthy of your reading, if not your library.

"If you want to know what a Capitalist is," quips one economist, *"just ask any COMMUNIST!"* Mistaken, misinformed, misanthropic he may be — but any Communist *can* define Capitalism at the drop of a polemic. *Can you?* Most often, we who thrive on latter-day Capitalism *can't define it.* Fewer still can even begin to explain *how it works.* But here at last, is a book which does just that. And much more. It is simple and lucid, without economic jabberwocky, without technical trappings, without tiresome charts and mugwumping statistics. With neither leftish liberalism nor rightish righteousness, HOW CAPITALISM CAN SUCCEED has you *knowing,* in clear detail, the HOW's, the WHY's and the WHY-NOT's of Capitalism; what it's made of; how it compares with rival economic systems; its challenges from within and without. Most significant of all, Dr. Pollard reveals how to help insure its future (and yours!) in simple, everyday actions and commitments.

Obviously *not* a how-to-succeed manual, Dr. Pollard's book is nonetheless bound to *expand your achievement* in the 1966 Real World of all-too-scarce dollars *and* none-too-common sense. Whether you be executive or entrepreneur, doctor or lawyer, teacher or student . . . no matter who you are, where you're going, or where you've been . . . your leisurely, unstudied browsing will, we firmly believe, be richly rewarding. Indeed, Dr. Pollard's incisiveness, simplicity and clarity can be the bedrock of *your own success* within our capitalistic system.

After reading *page 42,* for instance, you'll know why some men always seem to be on the *high side* of the cyclical teeter-totter. On the other hand, Dr. Pollard's straight-talk about your inherent "freedom to fail" *(page 79)* has you safely side-stepping the one Capitalistic booby-trap which has demolished more promising careers than any other. Are the "technical indicators" of today's curious stock market really reflections — ominous or optimistic, take your pick — of Capitalism's inexorable evolution? *(Read pages 38, 104, 171.)* When the table talk begins to crackle with high-voltage *isms,* wouldn't it be great if you'd read Dr. Pollard's fateful 267 words *(on pages 230 & 231)* which suddenly transform negative and positive charges into a jolting shock of socio-economic truth? Are rent and wage controls, even general "price ceilings," inevitable? *Or unthinkable?* If so, why? *Or why not?* Dr. Pollard's candid answers may raise a lot *more* questions — which only *you* can answer! For example: How will Capitalism's consumer-enlightenment "policy" affect *you? Your family? Your firm? Your community?*

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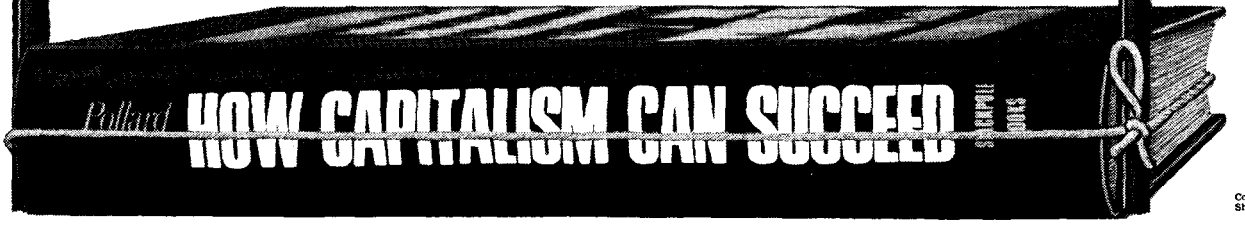

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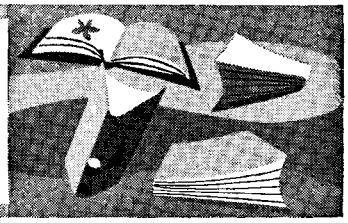
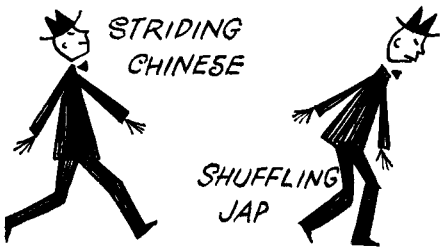
Trade Winds



An unconfirmed rumor has come to my attention that our FBI is well prepared for a World War III in which our major enemy will be China. Detention camps have been secretly prepared



in which will be "relocated" all the Chinese in the United States so that they may be screened, and prevented from sabotaging the war effort and from signaling Peking with short-wave radios.

If that is true, the concern of the FBI is understandable. The thought of enemy agents in our laundries and restaurants is a demoralizing one. War with China will require some orientation on the part of Americans, I have decided, and to ready myself for it I have referred again to the booklet on China presented to me by the Pentagon in 1944. The Caucasian dilemma is how we shall distinguish between the Japanese (our friends) and the Chinese (our enemies), since all Orientals look alike. Fortunately, a chapter is devoted to this problem. It is written and illustrated by Milton Caniff and it is to the point: "How to Spot a Jap."

It is really very simple. A Japanese has buck teeth, needs a shave and "is very unhappy about the whole thing." He squints, he is not to be trusted, and when he walks he "shuffles." The Chinese, on the other hand, "smiles easily," and when he walks he "strides." On the home front, then, watch out for these smiling striders.

Other sections of this booklet, prepared in Washington by our military authorities, are very helpful in evaluating our future enemy. It will be a tough war, because the Chinese "is a good soldier" who has "plain, common guts." Not only that, but "he speaks softly and smiles easily."

That smiling act wouldn't fool our GIs in the field any more than it will the FBI at home. But our boys over there will have to be on their guard because, as the Pentagon warns us, "of all the peoples of Asia, the Chinese are most like Americans. We are both humorous people. They like a joke just as well as we do, and they laugh at the same sort of thing . . . they believe in having a good time on earth while they are alive. They are better than we are, perhaps, at human relationships. They value these above all else, and have learned to get along with people through centuries of getting along with each other."

The Pentagon is trying to tell us something there, and I believe they mean to point out the weakness of the Chinese way of life. Human relationships are all right up to a point. But to value them "above all else" smacks of a foreign ideology. We would be fighting to prevent the spread of such a notion throughout Southeast Asia. According to the domino theory, one country falls to human relationships, toppling the next, and the next and so on.

The booklet I have been quoting from was published by the Pentagon in 1942 and was handed to me when I was on my way to the Orient. It says, "The first thing you should learn to say in China is 'I am an American.' It is the best passport you can have." It is apparent what our China experts mean by this. The Chinese, as we have been told, smile easily and laugh at our humor. When our boys bring up the matter of Americans and passports to China, the enemy will think it is a huge joke and will easily be won over to our way of life.

One day without warning, instructors Jim Hines and Lloyd Rodnick asked their freshman English classes at Flint

(Michigan) Community Junior College to write on the spot one-sentence definitions of democracy. Here are a few:

Democracy is buying a 1955 rusted Ford on credit.

Democracy is a dirty old bearded man picketing in front of the White House bearing a sign that says, "Draft those young punks."

Democracy is a theory of govern-

(*Continued on page 20*)

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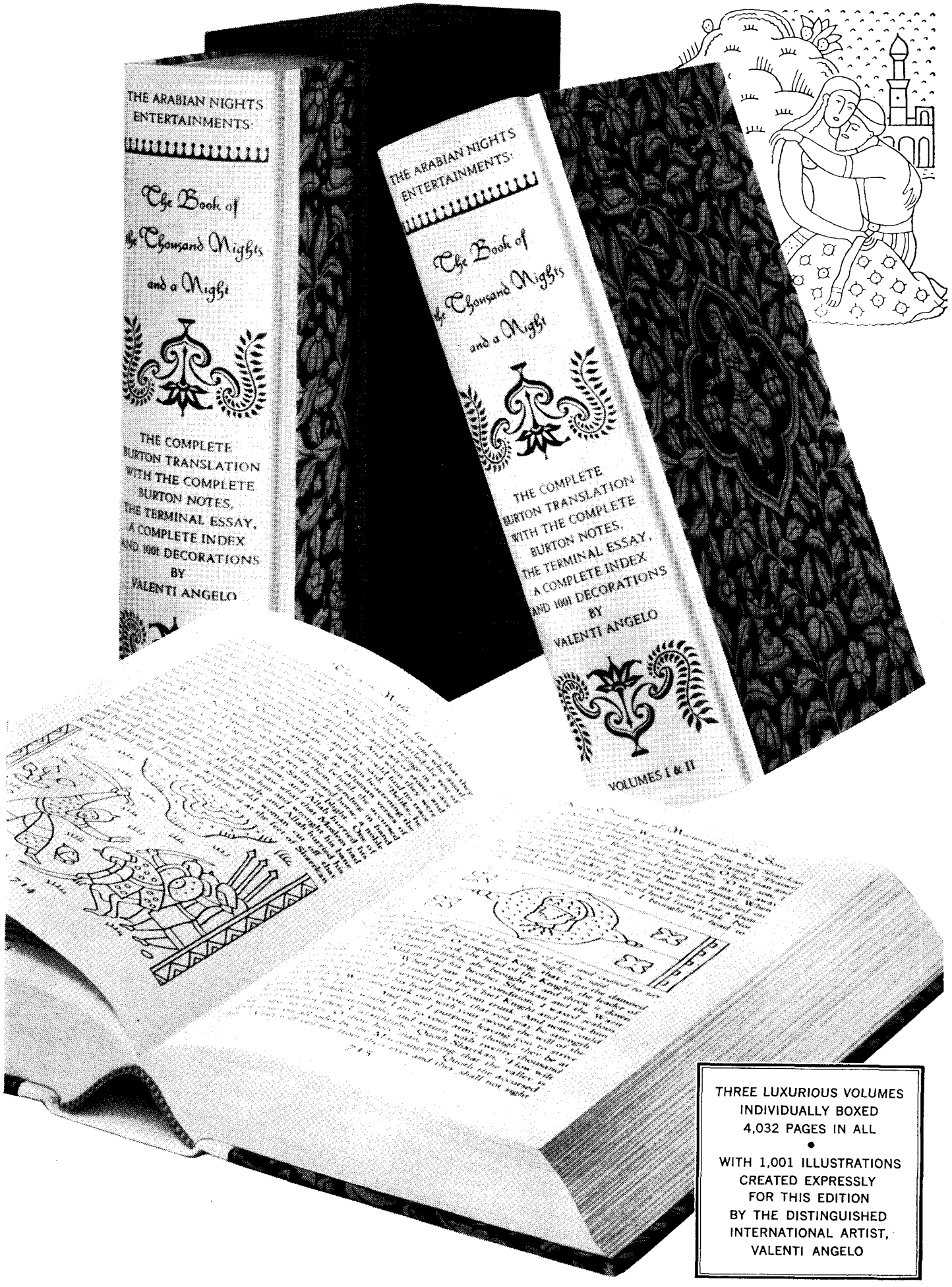
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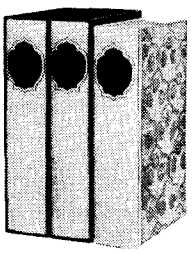

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CARL W. BUCHHEISTER
from his introduction to Summer Island

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The Sierra Club, founded by John Muir, is a nonprofit organization working in the public interest and supported by people who know that understanding and saving wildness is as important as health and education. The club's program is nationwide and includes wilderness trips, books, and films.

There are chapters and groups all over; branch offices in New York, Washington, Seattle, Albuquerque, and Los Angeles. The principal office is in San Francisco. Regular dues are $9 per year. Admission fee is $5.

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Continued from page 14

ment conceived and established on the earth and run into that same substance.

Democracy is burning your draft card and getting another one in the mail.

Democracy is voting without knowing anything about the candidates or the issues.

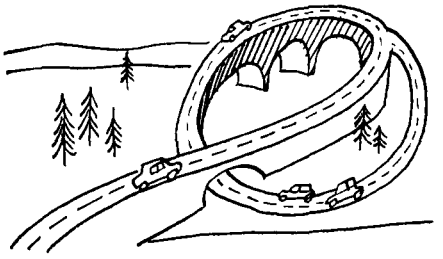
Democracy is having the world at your feet, selective service at your heels, and social status in your wallet.

Democracy is failing algebra and not telling your parents for two years.

Sharps and Flats: I understand that somewhere in the Midwest there is an unfinished interstate highway that ends in a clover leaf so that you can't drive off. You go around and under and come up going back in the other lane.

► Lois Lane will get married this month, but not to Clark Kent.

► Dave Steinberg tells me that he asked in a San Francisco book store for the anthology of black humor edited by Bruce Jay Friedman. He wasn't sure of the title, he said, but he thought it was *Black Humor* or *The Black Humorists.*



The clerk said, "Here is where we keep books of that nature," and led him to a segregated shelf where were displayed paperbacks by James Baldwin, LeRoi Jones, Ralph Ellison, Langston Hughes, etc.

► Telling about the California parties that Prince Philip attended, columnist Suzy Knickerbocker wrote, "There was no receiving line at the Al Fresco get-together . . ."

► That Al Fresco! He's always coming up with new gimmicks.

—JEROME BEATTY, JR.

SOLUTION OF LAST WEEK'S KINGSLEY DOUBLE-CROSTIC (NO. 1673)

J. WECHSBERG:

AN ACCEPTING HOUSE

(A *New Yorker Profile,* Feb. 1966)

An old man who comes every week to wind up* the Windmill and Whiteman grandfather clocks is a fifth-generation clockmaker, nearly on a par with Jocelyn Hambro, recently appointed chairman of the bank's board of directors, who is a sixth-generation banker.

* Word inserted to get the U.

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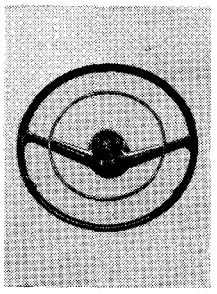
Sliding sunroof, made of solid steel, gives you all the benefits of a convertible without annoying wind.



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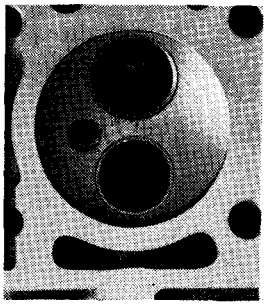

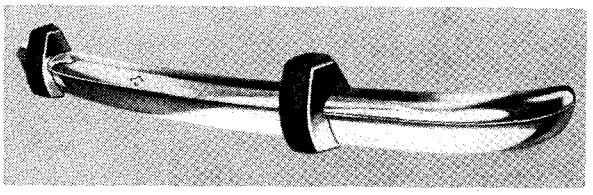

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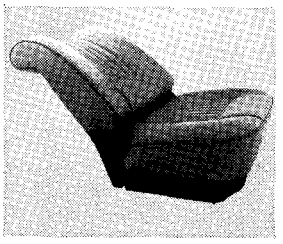

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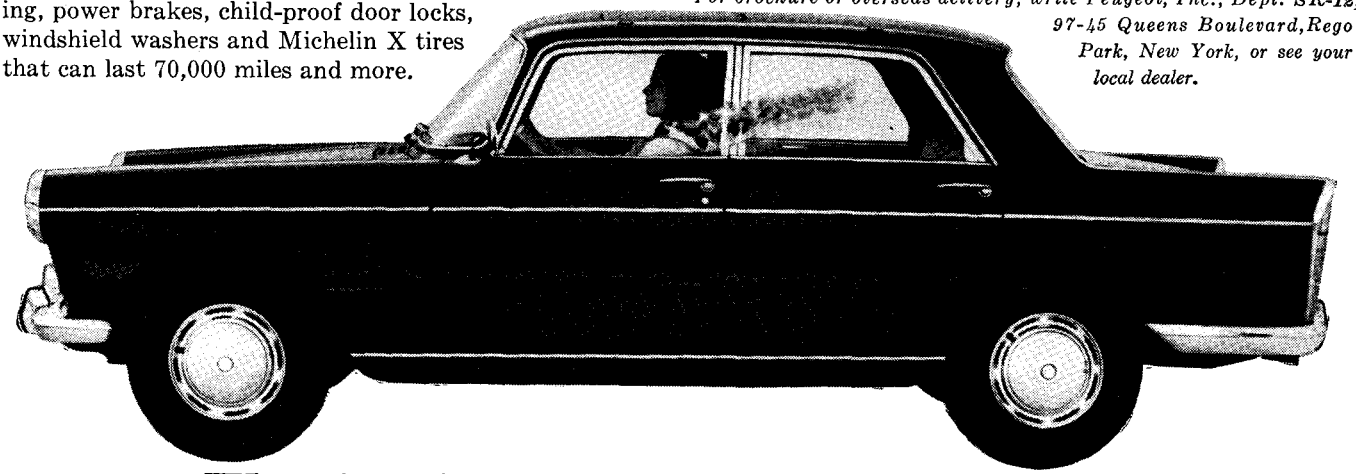

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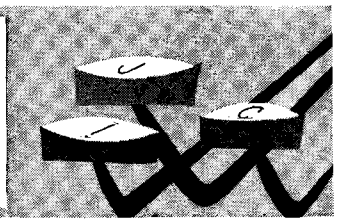
Manner of Speaking



Mumpsimus: I am grateful to Mrs. John A. Ward of Carlisle, Pennsylvania for calling my attention to the word "mumpsimus" of which Webster's Unabridged, Second Edition, has the following to say:

> **mumpsimus:** n. [A blunder for the L. *sumpsimus* we have received, the story running that an aged priest, when corrected for saying *mumpsimus* in the service, declared that he had said *mumpsimus* for thirty years, and would not change his old *mumpsimus* for the new *sumpsimus.*] A bigoted adherent to exposed but customary error; also, a custom or tenet so adhered to. *Archaic.*
>
> Doctors *mumpsimusses* of divinity. *Tyndale.*

I had not previously come upon the word, but I want Mrs. Ward to know I welcome it. I am sorry to note that Webster's classifies it as archaic, and I hereby declare my allegiance to it, pledging to do all I can to restore it to good usage. So mumpsimus a world as ours is cannot do without so useful a label.

For whatever pleasure it may offer Mrs. Ward, and for whatever help it may be to philomumpsimuses, my most memorable bird of this plumage was a sweetly determined aged schoolteacher I met in Kansas City in the summer of 1940. I went to Kansas City University as an instructor in English in February of 1940 and, lacking carfare to get out of town, I stayed on to teach summer school. Let me say I was in no unfriendly haste to leave Kansas City, and I meant, in any case, to return in the fall. Kansas City does, however, remain a good place to be away from during the summer. I could easily have been bribed away by an airline ticket to, say, St. Moritz. I can even confess that it was only because no one made any effort to bribe me in this way that I remained in town, teaching school for eating money.

Among the subjects I found myself teaching was American literature, and I was more than a bit uneasy to find that I was younger than any of the school teachers who were taking the class. I had just turned twenty-four, an age that gave me a bit of an edge on the seniors of the regular session, but that gave everyone in the summer school class an edge on me. Among my white heads was Miss Mumpsimus, who must have been within a year or two of retirement, and who took several occasions to imply that the maturity of her certainties was a better thing than the greenness of my confusions.

All went reasonably well, however, till we got to Longfellow and to *The Psalm of Life.* Longfellow has always been a poet toward whom I feel a massive lack of interest, but cribbing from my graduate school notes, from *The Cambridge History of American Literature,* and from a busy weekend in the library, I hope I managed to describe the work accurately, confining my unfavorable criticism of it to an analysis of its metrical monotony.

I had no sooner paused, however, than Miss Mumpsimus was upon me. "About the beginning," she announced, and she read:

> Tell me not in mournful numbers,
> Life is but an empty dream!....

"Yes?" I encouraged in my best-practiced professorial tone.

"Why do you say the poem is addressed to other poets?"

"Who else writes poems?" I asked.

"What's that got to do with it?"

"Everything, I should say. The very first line says, 'Don't tell me in sad poems.'"

"Sad poems?" said Miss Mumpsimus indignantly. "And where do you get *that* idea?"

"From 'mournful numbers,' of course."

There was a great deal more of that sort of thing, as I recall, but I finally understood that Miss Mumpsimus was taking "mournful numbers" to mean "sad multitudes," and I set out to explain where she had gone wrong. I cited Pope's "I lisped in numbers since the numbers came." I cited "Grief brought to numbers cannot be so fierce," though I still cannot remember who wrote it. I cited the fact that John Donne's religious poems are titled *Holy Numbers.* With these as examples, I pointed out that numbers means "metric quantities" and by extension, poetry in general. Miss Mumpsimus was having none of that.

Finally, however, she did agree to accept the authority of the dictionary, and to make the proof the weightier I went down the hall to my office and returned with Webster's Unabridged, from which I read the fifteenth meaning given:

15. **Poetry & Music.** a. Regular count

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In the world of a Japan Air Lines hostess, art is a foremost element of everyday life. She spends patient hours at *chanoyu*, the classic discipline that makes an art form of the simple serving of tea.

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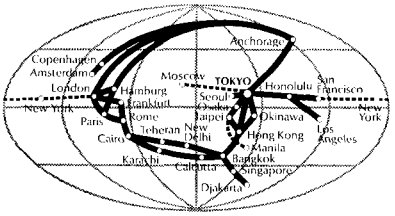

of syllables or beats, esp. with alternation of accents. b. *pl.* Metrical, esp. syllabic, verses or measures; hence, verses or verse.

Miss Mumpsimus read it for herself, bending over the desk, then straightened up to look at me with the disdain that must have shriveled generations of students. "For forty years," she declared, "I have been teaching this poem according to one of the very first meanings of the word 'number.' Do you really expect me to give that up for the *second* part of the fifteenth meaning?!"

If only I had known enough then to turn a few more pages of the dictionary to "mumpsimus" and to have her read that definition!

In any case, thank you, Mrs. Ward. And thank you again for helping me to establish something like a record for "remarks that come to us as we walk home from that party." It has taken me twenty-five and a half years to think of the right answer. I submit, however, that it was a dull party, and that I have not thought about it exclusively in the years between.

Mumruffin: Mrs. Ward made me a present of "mumpsimus" by means of a photo copy of page 1611 of Webster's Unabridged (2nd), and having drawn a red line around "mumpsimus" she proceeded, for its own sake, to draw another red line around the next word, which I am happy to pass on here, for its own (and sufficient) sake:

> **mumruffin:** *n.* The long-tailed titmouse. *Local Brit.*

Sumpsimus: I dislike the editorial "we" but in this case *sumpsimus* is too well balanced against *mumpsimus* and, if only in the name of symmetry, *sumpsimus* it is: *we have received*, via Bernard H. Sokol, a direct reply from the pigeons for whose extermination I have twice argued in this column. The gist of the pigeon rebuttal, as I have it from Mr. Sokol, is that they think of themselves as descended from a more ancient line, and that if anything has to be exterminated they nominate me. Pending my extermination, however, the pigeons want me to know they claim superior accomplishments in language, and that, though they may take it sitting down, they are not entirely defenseless. For my part I have to grant them solid debater's points for the last four lines of their statement:

> Tell me Ciardi—has anyone
> Named a language after you?
>
> We pigeons could deal with you
> and your kind,
> But the trouble is they erect so few
> statues to poets!

Touché.

—JOHN CIARDI.

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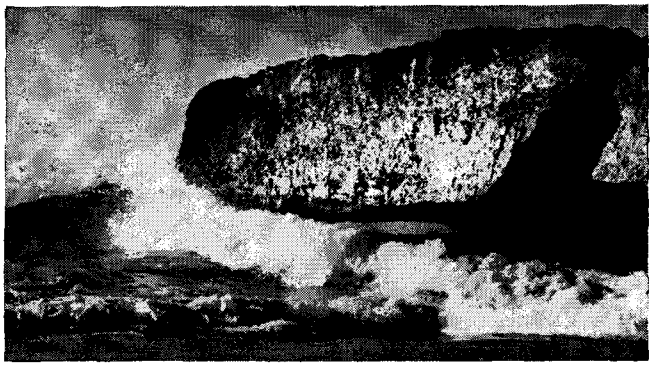
The gentle breeze on Long Bay seems to grow chilly after you hear the tale they tell about Sam Lord.

Sam was a buccaneer, the scurviest who never sailed the Seven Seas. That's right, never. Sam was too smart for that. He made his victims come to him.

Crafty Sam used to hang lanterns in the palm trees lining Long Bay near his castle. Seen from the sea, these swaying lanterns looked for all the world like ships at anchor.

And on dark nights many an unsuspecting mariner thought that's just what they were. And was lured to the false safety of the bay.

After the ship had smashed on the reefs, Sam and his band of cutthroat slaves would head for the wreckage.



To help, so they said.

And so they did. They helped themselves to the ship's cargo, which soon found its way to Lord's castle.

People are a lot more friendly around Barbados nowadays.

Pilferage is a tradition and no tourist board has ever had to remind Bajans to smile.

That's because Bajans love having guests. And they love showing off their Island. They've got much to show, too. A coast that looks like

[illegible] Shops loaded with duty-free bargains. Old-time sailing schooners.

30 miles of silken beaches. Half of them on the frisky Atlantic (a surfer's delight), half on the serene Caribbean (unsurpassed for any of the other water sports).

Another unusual claim Barbados can make: the Island has no summer. Or winter, depending on how you look at it.

That's because Barbados is located farther east than any other Caribbean island. And gets the cooling Eastern Trade Winds from Africa and Europe first, assuring temperatures that stay the same winter and summer.

For that reason you'd think that Barbados hotels wouldn't be hot with summer rates. But they do. They cut their prices just like islands that do have cold.

[illegible] delightful note on which to end this little message.

BARBADOS

For FREE booklet write: Barbados Tourist Board, 355 Lexington Ave., N.Y., N.Y. 10017. Or talk to your travel agent.

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SR's Check List of the Week's New Books

Crime, Suspense

No Escape. By Josephine Bell. Macmillan. $3.95.

Stalemate. By Evelyn Berckman. Doubleday. $3.95.

Widows Wear Weeds. By A. A. Fair. Morrow. $3.50.

Current Affairs

Communist China's Economic Growth and Foreign Trade: Implications for U.S. Policy. By Alexander Eckstein. Published for the Council on Foreign Relations by McGraw-Hill. $8.50.

Faces of Poverty. By Arthur Simon. Concordia. $3.75.

The New Class Divided: Science and Technology versus Communism. By Albert Parry. Macmillan. $8.95.

The New Left: The Resurgence of Radicalism Among American Students. By Phillip Abbott Luce. McKay. $4.50.

White Papers for White Americans. By Calvin C. Hernton. Doubleday. $3.95.

Fiction

The Blackboard Cavalier. By John Morressy. Doubleday. $4.50.

The Bright Young Man. By Mike Cohen. Lippincott. $4.95.

Fertig. By Sol Yurick. Trident. $5.95.

Generation. By William Goodhart. Macmillan. $3.95.

High Water at Four. By Jerrard Tickell. Doubleday. $4.50.

Jericho Sleep Alone: Berl Make Tea. By Chaim Bermant. Holt, Rinehart & Winston. $5.95.

The Last Warrior. By Mary Patchett. Doubleday. $4.50.

The Love Stones. By Howard Waldman. Doubleday. $4.95.

Never Call It Loving. By Dorothy Eden. Coward-McCann. $4.95.

The Running Foxes. By Joyce Stranger. Viking. $3.95.

School at the Frontier. By Géza Ottlik. Harcourt, Brace & World. $6.50.

The Trouble with Heaven. By Leland Frederick Cooley. Doubleday. $4.50.

The War Babies. By Gwen Davis. Coward-McCann. $4.95.

History

Bosworth Field: From Medieval to Tudor England. By A. L. Rowse. Doubleday. $5.95.

Invasion: 1066. By Rupert Furneaux. Prentice-Hall. $6.95.

Life in the North During the Civil War: A Source History. By George Winston Smith and Charles Judah. Univ. of New Mexico Press. $6.50.

Plans for Political Reform in Imperial Russia, 1730-1905. By Marc Raeff. Prentice-Hall. Hardbound, $4.95. Paperback, $2.95.

Miscellany

Backstage at the Mets. By Lindsey Nelson with Al Hirshberg. Viking. $3.95.

Death of the Sweet Waters. By Donald E. Carr. Norton. $5.95.

A Draught of Fishes. By F. D. Ommanney. Crowell. $6.95.

English Furniture: From the Middle Ages to Modern Times. By Margaret Macdonald-Taylor. Putnam. $8.95.

Exhumations. By Christopher Isherwood. Simon & Schuster. $5.

The U.S. Open, 1895-1965. By Tom Flaherty. Dutton. $4.95.

The Velikovsky Affair: The Warfare of Science and Scientism. Edited by Alfred de Grazia. University Books. $5.95.

The Wheelhouse Loafer. By Joseph Chase Allen. Little, Brown. $5.95.

Personal History

The Author of Waverley: A Study in the Personality of Sir Walter Scott. By Christina Keith. Roy. $4.95.

Confessions of an Irish Rebel. By Brendan Behan. Random House. $4.95.

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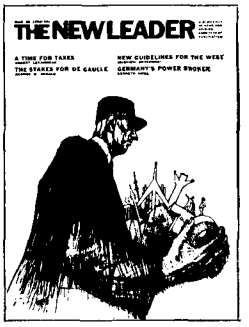

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—Grant Heilman.

Tenth Anniversary Science and Humanity Supplement

THE FRAGILE BREATH OF LIFE

How it came to be ★ How to keep it going

A HANDFUL of scientists had been talking privately since 1950 about the possibility of sailing out through earth's atmosphere and exploring the space beyond. The International Council of Scientific Unions had voted in 1952 to include interplanetary space voyaging in an eighteen-month-long examination of the physical ties between planet earth and its parent star, the sun. The special research period had been set to begin on July 1, 1957, under the name of the International Geophysical Year, but 1956 had come and most American men of science were skeptical of if not hostile to the idea that spaceships might add either to wisdom or to happiness.

In this negative atmosphere, with an eerily precise sense of timing matched by few other individuals I have known, the editor of *Saturday Review* chose the year 1956 to invite me to initiate the Science and Humanity Supplement.

After publishing two experimental issues in March and April of 1956, *SR* carried on its letters page in May an announcement that the new Supplement thenceforth would be a permanent part of the magazine.

Sputnik I went up from the steppes of Siberia in September of the following year, and the perspective of people everywhere changed. Having gone to the edge of earth's atmosphere and looked back, the explorers now have seen their home planet for the first time, with consequences that are just beginning to unfold. After generations of idolatry of scientific specialty, men see an urgent need for generalship competent to deal with earth's interdependent organisms in their myriad-faceted response to an evolving environment. The fragility of the breath of life is recognized with a new and deepened concern. The pages that follow were designed in the faith that *SR*'s readers might draw from them a stronger dedication to the common task of keeping that breath going.

—JOHN LEAR, *Science Editor.*

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THE ROLE OF OXYGEN

Until the age of extraterrestrial space exploration opened, the theory of evolution of life on planet earth did not correspond at all precisely to the story of life as told by the fossils in the rocks of the planet's crust. There were great gaps in the fossil record that no one could explain. But when rockets went out through earth's atmosphere to look closely at the sun, the reports they radioed back suggested a rational cause for the fossil sequence to Dr. Lloyd V. Berkner, father of the International Geophysical Year (1957-8). Below is a description of original research Dr. Berkner has done in company with Professor Lauriston Marshall of the Graduate Research Center of the Southwest. The findings are as revolutionary as the Darwin-Wallace theory of evolution itself. Their conclusion: Life evolved explosively with oxygen as fuel.

By LLOYD V. BERKNER and LAURISTON C. MARSHALL

THE record of life on earth, as it has been kept in the rocks of the planet's crust, still mystifies those who examine it closely. The story begins about two-thirds of the way back in the 4,500 million years of earth's existence. Judging from their fossils, all creatures that lived during the 2,500 million years of that time were one-celled organisms. Fossils of creatures containing more than a single cell do not appear until about 600 million years ago. Then suddenly the layers of rock which at that time were under water are filled with skeletons of many different kinds of multicellular life, and this is true of rocks all over the globe.

What could account for such a remarkable change everywhere on the planet simultaneously?

Charles Darwin pondered this question long and hard. Because he could not solve it in a straightforward manner, he delayed publication of his theory of evolution through natural selection (adaptation) of species. Darwin finally went around the problem by making an assumption: there must have been a long, gradual process of evolution from unicellular to multicellular life that left no recognizable trace behind. In the century since Darwin, the tools of rock study have grown progressively more sophisticated; but the connecting links in the chain of life he speculated on have not yet been discovered. Modern paleontologists wonder whether that phase of evolution occurred according to the time scale Darwin imagined or in another way.

About 150 million or so years after multicelled life appeared in the waters of earth, the fossil record shows spores on the land beside the water.

Some 10,000,000 years after that, green plants began to grow on the land.

About the same time, the first land animals appeared.

It seems evident from the sequence of these events that the spores were blown onto the land from aquatic plants that stuck their heads above the water, and then plants grown from those spores on the land provided a means of sustenance for animals that could then evolve ashore, finding there a physiological advantage over life in the water.

Among the fossils of this period are those of the lungfish (which breathe through snorkel-like tubes while buried in the mud) and of the four-finned fish —the crossopterygians—that are believed to be the progenitors of four-legged animals and thus of all amphibians: the reptiles and the mammals, including man.

The reason for the sudden migration of many forms of life from the water to the land at the time it occurred is as mysterious as the reason for the sudden proliferation of multicellular life in the water at an earlier time. Could it be a similar reason?

We believe so. A classically elegant confirmation seems implicit in the rocks. The message of the fossils needs only to be read exactly as it lies in place. The gist of the message, as we translate it, is that life proliferated explosively when the energy required to power life's functions became available in suitable form.

The oxygen atom is an incredibly efficient energy container, whether in the lone state or coupled in oxygen molecules or bonded triply in molecules of ozone. When fueling the respiratory process on which all animal life depends, it releases 674 calories of energy for every gram molecular weight of its substance. By contrast, fermentation (the other chemical process able to sustain life) frees only twenty-eight calories per gram at most and fifteen calories on the average.

THE great paradox of earthly life is that (except for certain parasites) all of its forms consisting of more than one cell need oxygen in order to obtain enough energy to survive; yet the vital components of all cells are fatally poisoned by oxygen. How did nature resolve this fundamental contradiction?

Logic suggests one reasonable answer. It is that ancestors of the cell in the life chain must have come into being in absence of oxygen. Such a supposition is supported from several directions. First, we know that many primitive organisms can exist without oxygen. Second, we know that independent multicellular organisms have not evolved by using fermentation. From this knowledge we deduce that nature, in experimenting with different ways of putting single cells together into multicelled structures, found no advantage—and perhaps a disadvantage—in the form of energy obtainable through the fermentation process. Third, what has been surmised about the origin of earth fits the conception that no appreciable amount of free oxygen was available for some time after the planet took shape.

According to the most widely accepted present-day thinking on this matter,

Lloyd V. Berkner and Lauriston C. Marshall are members of the faculty of the Graduate Research Center of the Southwest in Dallas, Texas. Scientific documentation for their observations in these pages has been published in *The Journal of the Atmospheric Sciences* and the *Proceedings of the National Academy of Sciences.* Their work has received financial support from the National Science Foundation.

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the earth was formed by condensation of debris and dust from the matter that also created the sun. Condensation of some of these planetesimals may have been as big as the moon, or slightly bigger, but the whole probably condensed from dust. Hence no fragment of the aggregated mass was great enough to produce a gravitational attraction competent to retain an atmosphere with it. The atmosphere which now envelops earth had to be generated from within the planet.

In order to retain the volume of complex compounds which today make up its crust, earth appears not to have existed in any substantially molten state at any time. Consequently, it can be assumed that the minerals composing the planet's interior originally held captive within them large quantities of gases. These gases were released gradually by volcanic eruptions caused by internal heating of radioactive elements, earthquakes, and local melting and separation of compounds in response to gravity. The volcanoes are believed to have built up the continents in this way, since estimates of the volume of solids belched along with the gases during the earth's lifetime approximately match estimates of the volume of the continental masses. Chemical analysis of ancient rocks indicates that no free oxygen was in the gaseous volcanic effluent, and this conclusion is supported by detailed study of gases vented by still active volcanic cones such as in the Hawaiian islands.

Nothing in the logic we have pursued so far conflicts with prevailing theories on evolution of life. All these theories (and laboratory experiments in which the amino acid building blocks of life have been synthesized by passing ultraviolet light through a vacuum containing other chemical elements but no free oxygen) hold that, until the life process reached the stage where it created a cell internally organized to protect itself, presence of free oxygen would stop the process dead.

But where do we go from here? How did life which could not exist in its earliest stages coeval with oxygen come to burgeon with the help of oxygen?

Theoretical explanations for life's beginnings were advanced in the 1930s by Alexander I. Oparin of Russia and John B. S. Haldane and J. D. Bernal of England; these have been much discussed since. But only in this last decade of intensive exploration of earth's atmosphere and the space beyond has it become possible to fit actual numbers into mathematical models which can be tested experimentally. Pictures of the sun, taken through telescopes riding on rockets and high-flying balloons, have disclosed the energy carried by wave lengths of ultraviolet light which can exert a most powerful influence on life (2,200 to 3,000 angstroms). This radiation originates in the sun's photosphere. Comparison of these pictures with pictures of thousands of stars comparable to the sun and at different ages show that the photosphere's output of ultraviolet in the life-giving range must have occurred at a steady rate throughout the duration of the earth's existence. Therefore, it is acceptable to calculate backwards in time, applying numbers derived from today's experiments to conditions that existed millions of years ago.

IF we begin our calculations with gases poured into the sky by volcanic action, we have the following chemical elements to consider as possible constituents of the primitive atmosphere: water vapor (up to 97 per cent by volume), nitrogen, carbon dioxide, hydrogen, sulfur dioxide, chlorine, hydrogen sulfide, carbon monoxide, methane, ammonia, and trace amounts of others.

Note that although oxygen in the free state is lacking from the list above, oxygen is present in combination with carbon, with sulfur, and with hydrogen in the water vapor. Since water vapor molecules are dissociated into hydrogen and oxygen atoms by ultraviolet light, a certain amount of free oxygen would thus become available. But here we encounter a natural mechanism which limits the oxygen that thus might be freed. What happens is that the oxygen atoms dissociated from the water vapor move further out into the atmosphere. There they become a screen to absorb the ultraviolet light before it can reach and act upon the water vapor. Hence, whenever dissociation of the water vapor reaches a certain point, the process stops itself. Nobelist Harold Urey some time ago suggested that there must be such an upper limit of oxygen produced in this way. We have calculated this limit as about one-thousandth of the present-day level of oxygen in the atmosphere. From these facts it is evident that oxygen derived from photodissociation would not have been sufficient to encourage life to reach the complex forms we know today.

HOW did oxygen-burning life forms evolve?

Nature's only oxygen manufacturing process other than the self-restricting photodissociation of water vapor is photosynthesis, through which living plants capture sunlight, rain water, and carbon dioxide from the air—so forming carbohydrate to feed the plants' own growth, and giving off free oxygen. Once the photosynthetic process got started, it could proceed without reference to the limiting "Urey effect" on photodissociation because photosynthesis employs visible light, in ranges of intensity well below those of the ultraviolet wave lengths captured by oxygen. But how did photosynthesis get started?

If we go back for a moment to the ventings of the primitive volcanoes, we find the element nitrogen high on the list of effluents. Nitrogen makes up four-fifths of our present-day atmosphere and is the principal intermediary in facilitating combination of three oxygen atoms into one molecule of ozone. It is the thick blanket of ozone manufactured by this method that hangs within twenty miles of earth's surface today and screens out the most ferocious radiations of the sun. But in the primitive atmos-

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phere with only little oxygen, a thin layer of ozone formed close to earth in the first birthdays of life on the planet.

If we now add the attenuating effects of the atomic oxygen screen high in the atmosphere to the water vapor screen in the atmosphere just below that and to the thin ozone screen just above the earth, we find that the energy in the solar ultraviolet after passing through all three screens is still too powerful to permit life. Only if we place thirty to forty feet of water beneath the thin surface-layer of ozone do we absorb the murderous force of the raw sunlight on the primitive earth.

AFTER we add the effect of the water to our equations, however, we discover a curious coincidence. The barriers we have assembled afford greatest protection against wave lengths of sunlight around 2,600 angstroms. This happens to be the region of the solar spectrum where present-day nucleic acids (2,630 angstroms) and proteins (2,750 angstroms) are most sensitive to damage. The coincidence suggests that the materials of which most living tissue is built and the genetic controls on replication of life forms might have had a selective advantage in the struggle for survival.

In other words, life on earth could have originated on the bottoms of pools, ponds, small lakes, or shallow protected seas fed perhaps by hot springs from thermal sources rich in nutrient chemicals which have demonstrated ability to form cell-like membranes about themselves in the presence of heat alone.

We can imagine organic compounds synthesized perhaps through the energy of ultraviolet light at the surface of the water and gently convected downward away from ultraviolet damage into regions where more complex organisms could be synthesized in the presence of visible nonlethal radiation. This model of primitive ecology calls for pool depths sufficient to absorb the deadly ultraviolet but not so deep as to cut off too much of the visible light. The model also calls for convection currents in the water sufficient to carry organic nutrients downward from the surface yet too slight to sweep the primitive organisms up from the bottom. Large lakes, or deep seas, or oceans would have been inhospitable to life at this early stage because the waves and currents would be violent enough to drive the primitive organisms to the lethal surface or disperse them out of reach of life-giving light.

ACCORDING to the fossil record in the rocks of the earth, the first cell life that incorporated photosynthesis appeared about 2,700 million years ago. At first, the effect of photosynthesis would not have made much change in the primitive level of atmospheric oxygen. Gradually, however, as the areas occupied by organisms capable of photosynthesis enlarged, accumulation of significant amounts of oxygen in the air would begin. Our calculations indicate that the limitation of the "Urey effect" would be overcome when the life-bearing pools of water covered somewhat more than 1 per cent of the present land mass of the earth.

On the early continents, then, the land would have been barren of vegetation but punctuated by a multitude of bodies of water in which photosynthetically active organisms were growing.

Nearly a century ago, during his famous studies of the spoilage of wines, Louis Pasteur observed that primitive organisms capable of living either without or with oxygen shift from fermentation (without oxygen) to respiration (with oxygen) whenever the amount of available oxygen reaches one-hundredth of the present-day level of oxygen in the atmosphere. In honor of its discoverer, this phenomenon is called the "Pasteur effect." By applying the "Pasteur effect" to our model of the early atmosphere of earth, we conclude that respiration became the dominant fueling system of life when the photosynthetic process pushed the supply of free oxygen above the one-hundredth-of-present-day level.

Respiration has always been recognized as a major evolutionary development. What has been overlooked is that only as oxygen concentrations permitted respiration was there an evolutionary demand for complex biological function to maximize energy capture. Respiration created altogether new evolutionary opportunities—for a circulatory system to convey the oxygen, a digestive system to employ it, a nervous system to control the process—in short, for complex multicelled organisms with advanced mechanisms of energy capture, control, and utilization.

The increase in oxygen in the atmosphere to about one-hundredth of its present level was automatically accompanied by a calculable increase in the total ozone content, since the ozone must be made from oxygen. When we incorporate the new ozone figures into our earlier calculations of the absorption of ultraviolet light by oxygen, ozone, and water we find that the lethal rays of ultraviolet are cut off at depths of only a foot or so of water instead of at thirty to forty feet as before.

In our model of the evolving atmosphere, the attainment of an oxygen level one-hundredth as great as the present-day atmospheric level of oxygen is referred to as the *first critical level.* Life then was still confined to the water but could survive at very shallow depths. The spread of life to the oceans became possible, since lethality was limited only to the very surface of the waters and

—*American Museum of Natural History.*

Artist's conception of how four-finned fish walked ashore.

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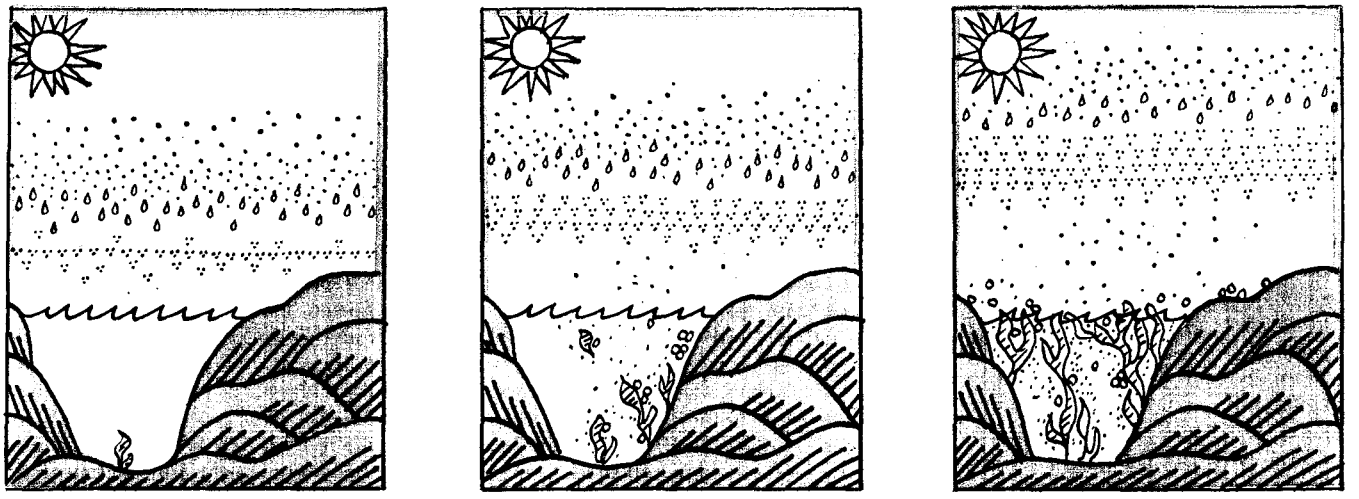

The upward progression of life from small, warm-water pond bottoms to pond surface and thence to pond-side land . . .

more advanced organisms could evolve some control over their movement in that environment. Indeed, as we read Sir Alister Hardy's charming account (in *The Open Sea,* published by Houghton Mifflin) of the unexplained diurnal depth-control of pelagic (free-swimming) organisms, found so generally in the seas today, we can hardly escape the notion of protective responses inherited from the time of *the first critical level.*

Was there a sudden evolutionary spurt at any time in geological history that would correspond to this vast new evolutionary opportunity provided when oxygen reached a hundredth part of its present concentration?

Yes, just one—at the beginning of the Palaeozoic era, 600 million years ago.

There is no evidence before that time of organisms more advanced than the most primitive of very ancient times. Yet within a few million years, with the opening of the Cambrian, there is widespread evidence of more advanced life forms. In a period of the order of 20,000,000 years, life branched out in such a variety of forms in the oceans, rivers, and lakes as to lay the foundation for all modern forms. At least 1,200 new species appeared during the ensuing Cambrian period in North American geological horizons alone. Some of these were quite large: skeletons of trilobites and large shellfish comparable to modern scallops or abalone, some as much as three feet in diameter.

Following this evolutionary explosion, marine photosynthesis further accelerated the build-up of oxygen in the atmosphere. Again the depth of the ozone layer increased. But the lethal glare of solar ultraviolet would still wither any organism that tried to raise its head above the water.

Continually life reached for the open air to maximize its energy for photosynthesis and was continually prevented from doing so by the burning radiation.

As oxygen built up, living processes could take place at shallower and shallower depths until oxygen reached a level of about one-tenth of the present atmospheric concentration. We have defined this point in our model as the *second critical level.* Then life could finally exist at or near the surface of the water. And for hardier forms of life, at least, the thickening depth of the atmospheric ozone layer opened the opportunity to evolve ashore, to spread in great profusion over the land surface to still further accelerate the processes of photosynthesis and respiration.

Can we identify this era in the fossil record?

Yes. There was an explosion of life on land about the time of the late Silurian: 400 to 420 million years ago.

Before that, in the mid-Silurian, there are fossil spores—the first evidence that plants were growing above the level of the waters in protected localities.

By the late Silurian, many classes of both plants and animals had moved ashore, and before long (early Devonian, 380 million years ago) great forests had appeared. As dense plant life spread over most of the land surface, it added to the rapid build-up of oxygen. With the accompanying increase in the thickness of the protective ozone layer, more sensitive forms of life began to appear on land. By the end of the Devonian

—Sketches by Doug Anderson.

. . . is suggested by sketches. Read from top left to bottom right. Dots represent oxygen, droplets water vapor, triangles ozone.

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period—350 million years ago—many forms of life pre-existing in the water had projected onto the land their evolutionary counterparts, including the amphibians and insects.

The oxygen content of the atmosphere may, in fact, have built up to a level *exceeding* our present atmospheric content by the time of the Carboniferous. This represented an overswing, with photosynthesis generating large quantities of oxygen and consuming comparable amounts of carbon dioxide. We can speculate that such an overswing would eventually correct itself. For carbon dioxide produces the so-called "greenhouse effect" by absorbing the infrared radiation returned toward space by the earth. Diminution of the "greenhouse effect" during the Carboniferous might have cooled the earth to such a degree as to account for the extensive ice ages of the Permian period, over 200 million years ago.

As organisms were constrained by the changed climate, a severe disturbance would occur in the delicate balance between photosynthetic build-up of the oxygen supply and oxygen losses to carbohydrate synthesis and to combination with metals, especially with iron. Oxygen would disappear from the atmosphere entirely in 2,000 years if the supply were not constantly renewed by growing plants (including aquatic plants, which account for at least four-fifths of present-day photosynthesis on the earth). So a sharp decline in photosynthetic activity certainly would lead to an abrupt catastrophic reduction in oxygen concentration.

We might find supporting evidence for such speculation on the cause of the ice ages if we could determine whether the great reptiles of the Mesozoic era attempted to acquire a greater lung capacity before they disappeared suddenly near the end of the Cretaceous from both land and sea.

Let us, in conclusion, consider the implications of these events in historic geology and palaeontology. Evolution during any geological period must be interpreted as a complex interaction between the level of oxygen generated by living organisms and the way in which that level produces new opportunities for evolution. Our thesis is that, from time to time, critical stages in the level of oxygen are reached, affording vast opportunities that are immediately seized by physiological responses of organisms. Conventional evolutionary thinking is strained by the speed and complexity of these great evolutionary leaps. But we believe the fossil record says that evolution can proceed as rapidly as combination, selection, and adaptation permit. If our interpretation is correct, a considerable step can be taken in quantifying evolution.

The Origin of Life Itself

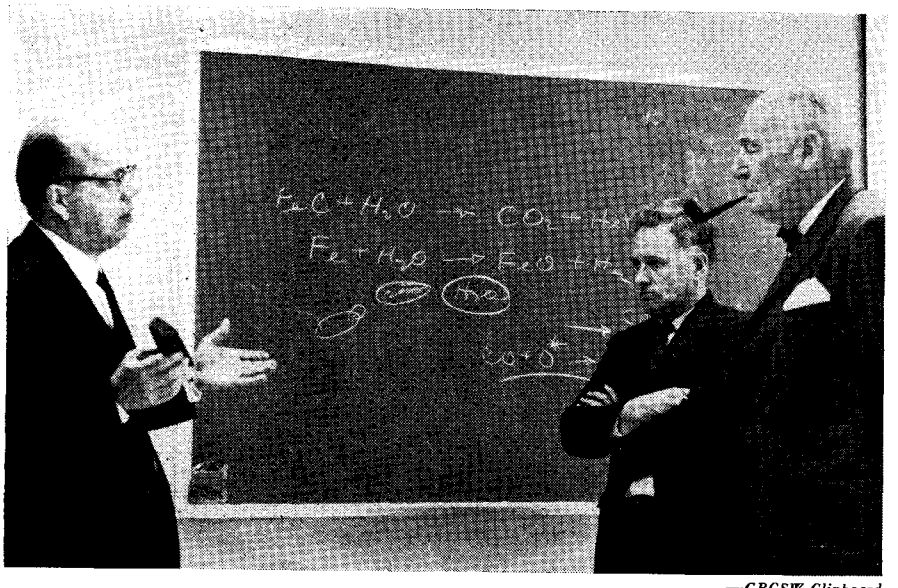
IF EARTH'S ATMOSPHERE CAME INTO BEING in accord with the theoretical model described in adjacent columns of this tenth anniversary issue of *SR*'s Science and Humanity Supplement, the most popular current scientific theory of the origin of life on earth must be drastically revised. For this theory holds that amino acids—the fundamental components of proteins, which constitute most living tissue—were created originally by solar radiation bombarding a dense miasma of methane and ammonia surrounding earth. And the Berkner-Marshall model of the atmosphere begins with the effluent of erupting volcanoes, which includes nitrogen, carbon, hydrogen, and a number of other chemical elements as well as methane or ammonia but is composed predominantly of water vapor. Since ammonia quickly dissolves in water, ammonia could not survive in the environment of the Berkner-Marshall model long enough to become a major component of the atmosphere.

In a recent seminar at the Graduate Research Center of the Southwest at Dallas, Texas, Dr. Philip Abelson, director of the geophysical laboratory of the Carnegie Institution of Washington and editor of *Science*, journal of the American Association for the Advancement of Science, disclosed that he had roughed out a new approach to life's origin based on the Berkner-Marshall atmospheric model. Dr. Abelson told scientists assembled at the Dallas institution that there is no evidence for a methane-ammonia atmosphere at any stage of earth's existence. On the contrary, he said, chemical composition of earth's oldest known rocks and the absence of krypton and xenon from our present atmosphere argue persuasively against the methane-ammonia theory. On the other hand, Dr. Abelson said, there is firm experimental support for the proposition that molecules of hydrogen, carbon, and nitrogen (such as those released by volcanic activity) would produce amino acids if bombarded by sunlight of 2,536 angstrom units wave length.

SR's science editor invited Dr. Abelson to propound his new speculations about the beginnings of life in this anniversary issue of *SR*. Dr. Abelson declined on the ground that his ideas needed to be "cooked" thoroughly, by exposure to qualified critics in pertinent fields of scientific specialty, before being offered for general publication.

A thumbnail summary of Dr. Abelson's new concept can be found in Volume IV, No. 14 of *Clipboard*, a faculty and staff organ of the Graduate Research Center of the Southwest. The picture below is reproduced from that issue of *Clipboard* by courtesy of *Clipboard*'s editor, Alfred Mitchell. Pictured are Dr. Abelson (left) in a blackboard discussion with Dr. John Jagger, of the research center's biology division, and (right) Dr. Lloyd V. Berkner, father of the International Geophysical Year, one of the founders of the GRCSW and co-author of the new model of the atmosphere.

—J.L.



—*GRCSW Clipboard.*

Dr. Philip Abelson (left) illustrates a point to Drs. John Jagger and Lloyd V. Berkner at Graduate Research Center of the Southwest in Dallas, Texas.

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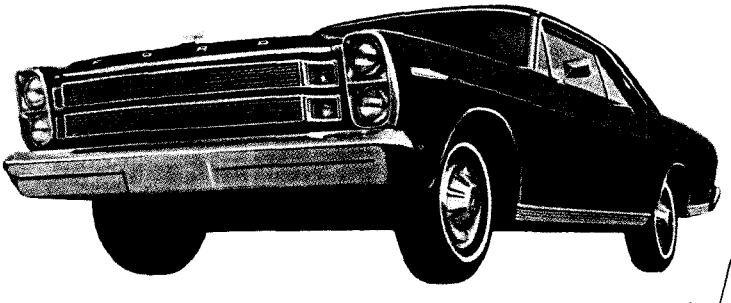

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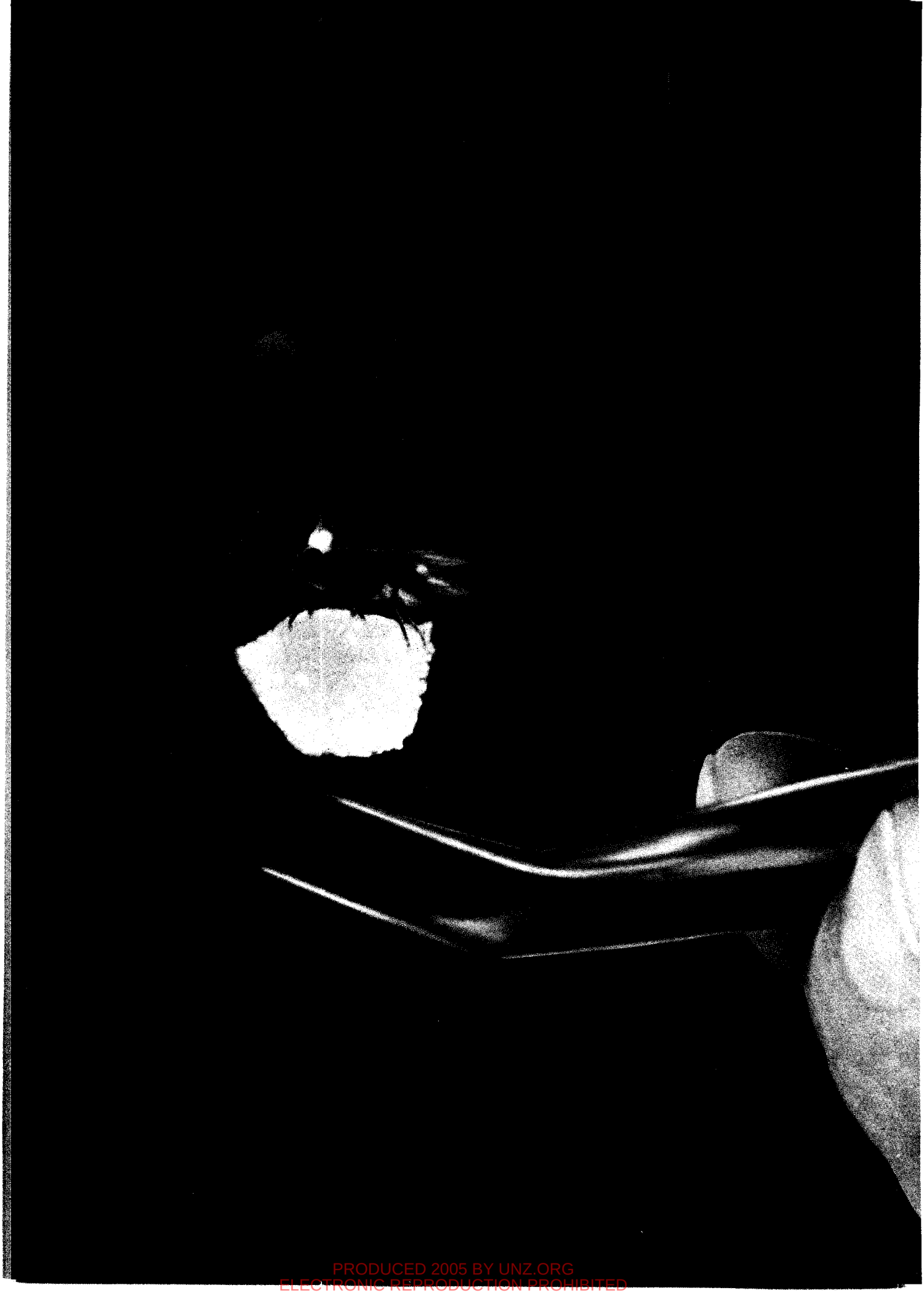

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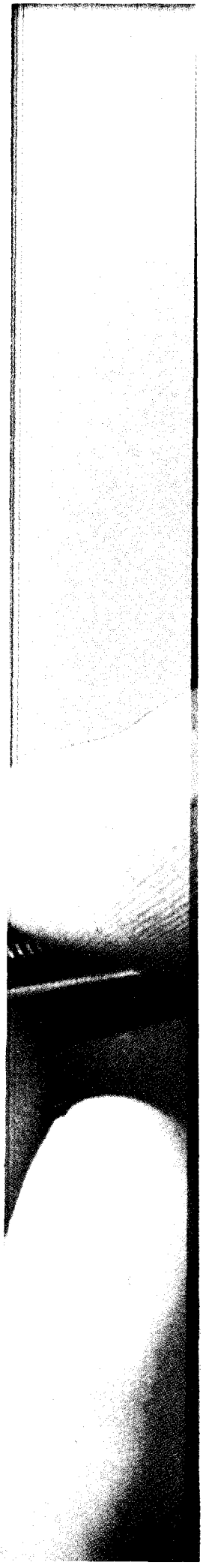

This fly is buzzing an IBM computer with new facts about your eyes

ANYONE who has ever swung a fly swatter knows that a housefly is a whiz at dodging danger.

What makes a fly so spry?

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The housefly in this experiment is in contact with a sensitive meter that can measure its slightest move. Soon it will be startled by a ray of outside light.

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Clues about you

Nine out of every ten messages your brain receives—like the words you're reading now—are sent by your eyes. Yet biologists have only a sketchy idea of how the eye converts light images into electrical nerve impulses, and how impulses are received by the brain and translated into specific actions.

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Working with flies and other simple insects, Caltech's scientists have used computer studies to gain new information about the interaction of the eye and the brain—and the ways we respond to the world around us.

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IBM®

This housefly, holding its "pacifier," is giving information to an IBM computer. These experiments help Caltech biologists gain new insight into how we see, and how we respond to outside stimuli.

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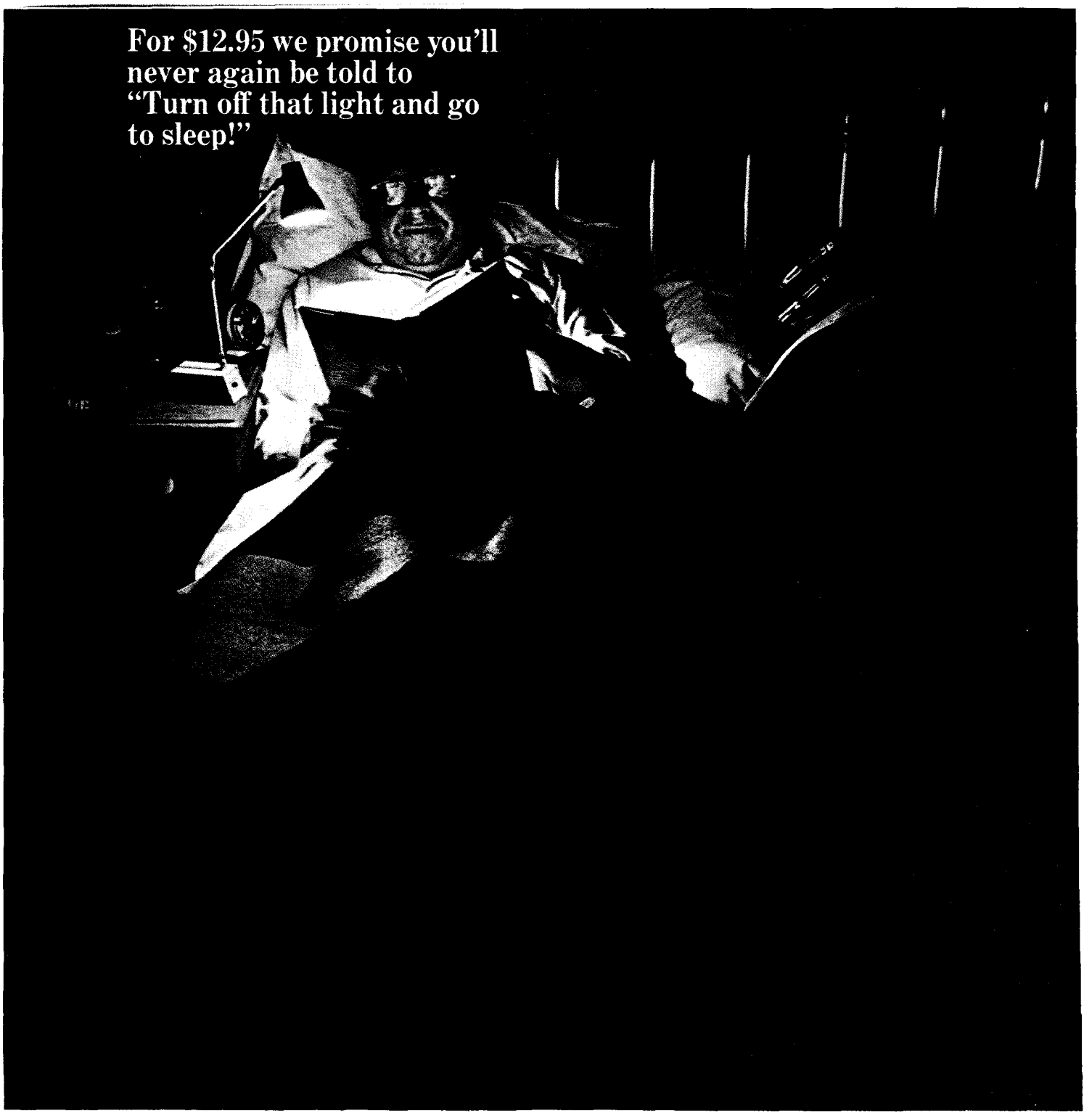

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Luxuriant plant life sank beneath water, locking up carbon that otherwise would have drawn off oxygen used in evolving life.

THE FRAGILE BREATH OF LIFE: HOW IT CAME TO BE

THE ROLE OF THE OCEANS

By ROGER REVELLE

ONLY about one two-thousandth of the atmosphere and one ten-thousandth of the ocean are carbon dioxide. Yet, to living creatures, these small fractions are of vital importance. Carbon is the basic building block of organic compounds; plants obtain all of their carbon from atmospheric or oceanic carbon dioxide; marine and terrestrial animals, including man, either directly or indirectly procure the substance of their bodies from the carbon compounds made by plants.

For most of the past billion years, the two fundamental processes of life on the planet earth have been photosynthesis and respiration. In photosynthesis, plants use the energy of sunlight to break down water and combine its hydrogen with carbon dioxide to form organic matter in their own tissues. The oxygen freed from the water escapes into the air or into the oceans.

Roger Revelle, one of the world's foremost oceanographers, is director of Harvard's new Center for Population Studies.

Plants gain energy for their vital activities through respiration—in effect, the reverse of photosynthesis; that is, they combine free oxygen with the organic matter in their own tissues to produce carbon dioxide and water. All animals and most bacteria ultimately obtain all their energy in the same way. On an earth-wide basis, both photosynthesis and respiration are rapid processes: an amount of oxygen equal to the total in the atmosphere is freed by photosynthesis of marine and land plants every few thousand years, and all the atmospheric carbon dioxide is cycled through land plants in about thirty years. The rate of respiration would just equal the rate of photosynthesis, and no free oxygen would accumulate, were it not for one remarkable fact about the earth—it has oceans.

Earth is sometimes called the water planet because of the large quantities of liquid water on its surface, unlike all the other members of our solar system. To permit free oxygen to accumulate in the atmosphere, it is essential that this water, instead of being spread in a uniform film over the surface, is gathered together in deep basins surrounding the huge islands we call continents. The reason is as follows.

Ever since continents and oceans have existed on earth, the land surfaces have been continually worn by wind and running water. The debris from this destruction has been washed and blown downward to the ocean floor. Deposited there as oceanic sediment, some of this debris later became cemented into rock and was uplifted to help rebuild the continents.

FROM the standpoint of the formation of oxygen in the atmosphere, the most important components of the oceanic sediments were the carbon-containing remains of plants and animals. At any one time, the amount of carbon being deposited was only a very small fraction of the living and dead organic matter on the earth, but over a billion years the total deposition was very large. If this carbon had not been withdrawn from the cycle of photosynthesis and respiration, it would have combined with and locked

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up oxygen as the oxygen was produced by photosynthesis; withdrawal of the carbon permitted oxygen to accumulate in the atmosphere.

Oxygen makes up 20 per cent of the volume of the atmosphere and carbon dioxide only three-hundredths of 1 per cent; but if, as seems likely, nearly all the oxygen has been produced by the photosynthesis of green plants during much of the past billion years, then the total amount of carbon dioxide that has passed through the air during this time must be at least equal to the amount of oxygen now present in the air.

The geologic evidence of the rocks shows that in fact volcanoes and volcanic springs have brought very much larger quantities of carbon dioxide to the surface. The total amount of carbon dioxide released during the lifetime of the earth was at least 40,000 times the quantity of carbon dioxide now present in the air. Most of this combined with calcium or magnesium freed by the weathering of silicate rocks and was precipitated on the sea floor as limestone or dolomite. About one-fourth of the total quantity, at least 10,000 times the present atmospheric carbon dioxide, was reduced by plants to organic compounds and became buried as organic matter in the sediments. A small fraction of this organic matter was transformed into the concentrated deposits we call coal, petroleum, oil shales, tar sands, or natural gas. These are the "fossil fuels" that power the world-wide industrial civilization of our time. The carbon in every barrel of oil and every lump of coal, as well as in every block of limestone, was once present in the atmosphere as carbon dioxide.

Throughout most of the half-million years of man's existence on earth, his fuels consisted of wood and other remains of plants which had grown only a few years before being burned. The effect of this burning on the content of atmospheric carbon dioxide was negligible, because it only slightly speeded up the natural decay processes that continually recycle carbon from the biosphere to the atmosphere. During the last few centuries, however, man has begun to burn the fossil fuels that were locked in the sedimentary rocks over 500 million years, and this combustion is measurably increasing the atmospheric carbon dioxide.

From 1860 to 1959, the amount of carbon dioxide produced by combustion of fossil fuel, chiefly coal, was equal to nearly 14 per cent of the atmospheric carbon dioxide. The accuracy of estimates of the total carbon dioxide content of the world atmosphere before 1958 was too low to allow satisfactory calculation of what fraction of this carbon dioxide from fossil-fuel combustion remained in the atmosphere. In the middle 1950s, however, new instruments utilizing the infrared spectrum of carbon dioxide were developed. These allowed rapid and very accurate measurement of the carbon dioxide content of air samples. As part of the program of the International Geophysical Year, a study was made of the total carbon dioxide content of the atmosphere and the changes in it from year to year. The two most successful sets of observations were supervised by Dr. Charles David Keeling of the Scripps Institution of Oceanography: one at the U.S. Weather Bureau Station near the top of Mauna Loa mountain on Hawaii, the other at the U.S. Scientific Station at the South Pole. Some 15,000 measurements were carried out near these centers of vast atmospheric mixing, far from uncontrollable sources of contaminants. Because of the nearly ideal locations, together with the high precision of the instruments, and the extreme care with which the samples

were taken, it was possible to estimate the trend of atmospheric carbon dioxide with an accuracy greater by two orders of magnitude than ever before.

The data show clearly and conclusively that, from 1958 through 1962, the carbon dioxide content of the atmosphere increased by 1.15 per cent. The increase from year to year was quite regular. During the same five years, United Nations' statistics show that fifty-three billion tons of carbon dioxide were produced by the combustion of coal, lignite, petroleum and other liquid hydrocarbons, and natural gas. This is 2.26 per cent of the 2,350 billion tons of carbon dioxide present in the atmosphere in the early 1950s. We see from these figures that almost exactly half of the fossil-fuel carbon dioxide remained in the air.

The other half of the carbon dioxide released by fossil fuels was taken up in the ocean and in the biosphere, that is, mainly in trees and other living plants and in oceanic and soil humus.

If the carbon dioxide produced by burning fossil fuels during the last hundred years was divided among the air, the sea, and the biosphere in the same proportions as in the five years from 1958 through 1962, then the quantity of carbon dioxide in the air at the beginning of the present decade was about 7 per cent higher than in the middle of the nineteenth century.

The United Nations Department of Economic and Social Affairs has projected world energy requirements up to the year 2000. The required fossil fuel combustion would give an amount of atmospheric carbon dioxide 25 per cent greater than the amount present during the nineteenth century. The uncertain rates of world economic development and of introduction of atomic energy as a substitute for fossil fuels raise doubts about the reliability of this estimate. We can with greater confidence say what would be the total amount of carbon dioxide injected into the air if all recoverable reserves of fossil fuels were consumed. At present rates of expansion in fossil fuel consumption, this condition would be approached within the next 150 years. If all the estimated 3,000 billion tons of reserves were recovered and burned, 7,850 billion tons of carbon dioxide would be produced—about 340 per cent of the amount now present in the atmosphere.

Although the date when it may occur is somewhat uncertain, a 25 per cent increase in atmospheric carbon dioxide within the next few decades is not, therefore, an unreasonable prediction. Such a rise might be sufficient to produce significant effects on climate; it would almost certainly cause marked changes in the temperature and other properties of the stratosphere.

Carbon dioxide is nearly transparent to visible light, but at all levels in the atmosphere the carbon dioxide molecules absorb infrared radiation and reradiate it in all directions, partly downward and partly upward. In the lower atmosphere, some of the downward emission of infrared from the carbon dioxide molecules reaches the earth's surface and must be reradiated again. Thus the total amount of infrared radiation from near the ground is increased. To maintain a heat balance, the temperature near the ground must be higher than it would be in the absence of carbon dioxide. This is the so-called "greenhouse effect."

CARBON dioxide and water vapor absorb and emit infrared radiation at nearly the same wave lengths. Hence an increase in either carbon dioxide or water vapor will result in an increase of the temperature of the lower air. A rise in temperature due to an increase in water vapor will not affect the atmospheric carbon dioxide; but a rise in temperature from added carbon dioxide tends to increase evaporation, accelerated evaporation tends to raise the water vapor content of the lower air, augmentation of water vapor means increased absorption of infrared, and the magnified infrared radiation brings about a still further rise in temperature. We have here a classic example of a feedback mechanism.

In the stratosphere, the effect of an increase in carbon dioxide is exactly the

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opposite of the effect of an increase near the ground. The amount of water vapor is very low, and the temperature is mainly determined by the balance between warming due to absorption of sunlight by ozone and cooling due to emission of infrared radiation by carbon dioxide. Since the total infrared radiation is constant and equal to the incoming sunlight, the temperature must go down when the number of carbon dioxide molecules increases.

Unfortunately, our present understanding of the physical processes that determine weather and climate is not sufficient to allow us to make very useful predictions about the effect of an increase in atmospheric carbon dioxide, except to say that the average rise in temperature over the earth would probably not be large. The best and most recent calculations have been made by the German meteorologist, F. Möller, and the American, Syukuro Manabe. Dr. Manabe was able to compute the transfer of heat through a vertical column of the atmosphere with different carbon dioxide contents. He concluded that a doubling of carbon dioxide would result in a temperature increase of about 4 degrees Fahrenheit, provided that the relative humidity remained constant. With a 25 per cent increase in carbon dioxide and a constant relative humidity, the rise in temperature would be about 1.2 degrees Fahrenheit. Considerably larger changes would occur in the stratosphere. A 25 per cent increase in carbon dioxide would cause stratospheric temperatures to fall about 3.5 degrees Fahrenheit at an altitude of 100,000 feet, and 7 degrees Fahrenheit at 130,000 feet.

CLIMATIC changes depend both on changes in vertical heat-transfer and on the general circulation of the atmosphere. The latter should be related to the spatial distribution and time variation of carbon dioxide and water vapor content. The ratio of carbon dioxide to water vapor is higher in the polar regions than in low latitudes, higher in winter than in summer, and much higher in the stratosphere than near the ground. For example, the volume of carbon dioxide in the atmosphere at high latitudes is about half the volume of water vapor, while near the equator it is less than a tenth of the water vapor volume. As a result, the radiation balance of the earth will be affected differently at different seasons, latitudes, and heights by changes in the atmospheric carbon dioxide content.

Without a more comprehensive model of the atmosphere than we now possess, it is impossible to make quantitative predictions. But in general we should expect that the effect of the differential distributions of carbon dioxide and water vapor would make the atmospheric circulation more sluggish as the carbon dioxide content rises.

Some meteorologists have argued that the world-wide atmospheric warming between 1885 and 1940 was brought about by the increase in atmospheric carbon dioxide. During this period, the mean annual air temperature over the entire earth rose by nearly 1 degree Fahrenheit. Warming occurred in both hemispheres and at all latitudes, but the largest rise was observed between 40 degrees and 70 degrees north latitude, where the average winter temperature rose by nearly 3 degrees Fahrenheit.

There are two difficulties with this argument: One, prior to 1940 the increase in atmospheric carbon dioxide from fossil-fuel combustion was only 4 per cent, and this was probably too small to produce the observed temperature changes; two, the warming of the surface air did not continue much beyond 1940. Between 1940 and 1960, additional warming occurred in Northern Europe and North America, but for the world as a whole, and also for the northern hemisphere, there was a slight lowering of about 0.2 degrees Fahrenheit in mean annual air temperature. Yet during this period more than 40 per cent of the total carbon dioxide increase from fossil fuel combustion occurred.

In general, our attitude toward the changing content of carbon dioxide in the atmosphere that is being brought about by our own actions should probably contain more curiosity than apprehension. Human beings are now carrying out a large-scale geophysical experiment which, if adequately documented, may yield a far-reaching insight into the processes determining weather and climate. We must not forget, however, that even a relatively small rise in the average annual temperature of the atmosphere might be accompanied by other more serious changes, for example, shifts in the position or the width of belts of low rainfall.

The possible future changes in climate that may be brought about by increases in atmospheric carbon dioxide give a unique justification to research and development on ways of modifying climate by deliberate human action. Man-made climatic modifications that might benefit some regions could be deleterious to others, and this raises serious ethical and legal objections to projects for carrying out such modifications. But these objections do not apply to attempts to bring about climatic changes that would counteract those that might be produced by an increase in the amount of atmospheric carbon dioxide.

FOR example, a change in the radiation balance in the opposite direction could be produced by raising the albedo, or reflectivity, of the earth. Such a change in albedo could be brought about by spreading very small reflecting particles over large oceanic areas. The particles should be sufficiently buoyant so that they will remain close to the sea surface, and they should have high reflectivity, so that even a partial covering of the surface would be adequate to produce a marked change in the amount of reflected sunlight. A fine powder of latex or of a light-colored opaque plastic, dispersed by a machine something like the smoke generators used in World War II, might do the job very well. Rough estimates indicate that enough particles to cover a square mile effectively could be produced for perhaps $100. A 1 per cent change in reflectivity might be brought about for about $500 million a year, particularly if the reflecting particles were spread in low latitudes, where the incoming radiation is concentrated. Considering the extraordinary economic and human importance of climate, costs of this magnitude do not seem excessive. An early development of the needed technology might be useful in inhibiting the formation of hurricanes in tropical oceanic areas by partly preventing the absorption of sunlight in the subsurface ocean waters, thereby depriving these storms of the energy they need to build up and maintain their ferocious intensity.

"Which side of the moon do you like best?"

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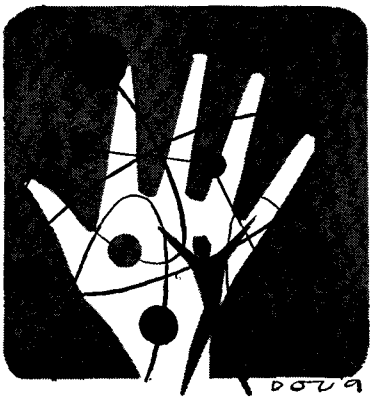
The Third Culture

TEN YEARS AGO, SR initiated a monthly supplement on science, edited by John Lear. It was *SR*'s second magazine-within-a-magazine venture, the first being devoted to recordings, under the editorship of Irving Kolodin. Subsequent supplements on education, edited by Paul Woodring and James Cass, and on communications, edited by Richard L. Tobin, rounded out the monthly cycle.

The purpose of the supplements was to deal with primary aspects of creativity and systematic thought in the modern world. A more particularized purpose in instituting the science section was to open up a direct channel of communication between scientist and non-scientist. It seemed to the editors that the existing lines of separation were arbitrary and unreal. There was a degree of artistic and humanistic concern in science that many non-scientists tended to ignore, and a degree of discipline and systematic thought in the arts that many scientists tended to deny. This lack of effective communication served as the basis, some years later, for C. P. Snow's original Rede Lecture on "Two Cultures and the Scientific Revolution."

The wall of separation today between the formal scientific community and the rest of the intellectual community is far less formidable than it was a decade ago. There is at least a vocabulary for discourse between scientist and non-scientist. Rapport no longer requires special indulgence. The man of the liberal arts has lost much of the old sense of mystification about the laboratory and engineering world. And the scientist has gained a new respect for the intangibles and the individualistic course of the artist.

With full respect for C. P. Snow, however, the main problem of the two cultures is not now, nor has it been for some time, the absence of communication between scientist and non-scientist. The problem has to do with what is being communicated. The scholars or artists and the scientists are talking to each other but not about the right things. Here we come to the real failure of the two cultures. Creative brainpower and advanced skills are not being directed to the largest need of the human species. The common and tragic failure of both the arts and the sciences is that they have given most of their energy and focus to the immediates and intermediates and very little to the ultimates. They have advanced the human condition without necessarily safeguarding the human estate. Each has served its own tradition without expanding it to encompass the essentially new problem of a world that has become one before it has become whole. In this sense, the problem is not what happens between the two cultures. The problem is what happens between the two cultures in history.



There is no doubt that the worlds of the systematic thinker and the creative artist have been productive and, in many respects, prosperous. But there is still a question of total relevance, a question concerning the uses to which brainpower and scholarship and artistry are put, and the directions they take; a question involving the safety of the world environment. If the two cultures don't understand the requirements of world peace, and if they fail to serve world peace in the most fundamental sense, they become detached from their most important function—no matter how firmly they may be attached to everything else.

In his second Rede Lecture in 1963, C. P. Snow sought to correct the impression given by the earlier lecture that he was more concerned about communication than about human problems and politics. He made it clear that he *was* concerned and indeed optimistic about the potentialities of science. And he was most eloquent and persuasive in calling for the full release of human intelligence in closing the gap between the world's rich and poor. This is all to the good, but the struggle against poverty needs a framework of possibilities. No fundamental progress against poverty is possible so long as a large proportion of the world's energies and reserves goes into things that can be used only for destructive purposes. And no poverty this earth has known will have greater dimensions than that which will follow the general collapse of peace in an atomic age.

Sir Charles spoke of the significance of the Industrial Revolution and gave emphasis to the untapped possibilities of applied science. But the central significance of the Industrial Revolution transcends economic change or the possibilities for good. The central significance of the Industrial Revolution is that it created engines for world destruction without creating the instruments for control. The reach of science and engineering has superseded the capacity for social and political organization. The betterment of human society depends even more on the conditions of an enforceable peace than on an ingenious technology.

The need today is for a Third Culture —one concerned with the total connection between total cause and total effect, one which recognizes that human destiny cannot be served or assured until tribalism, however elevated its station or sophisticated its language, gives way to a world view. —N.C.

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LETTERS TO THE EDITOR

Modifying the Weather

YOUR ACCOUNT of the recent history of weather modification [*SR*, Apr. 2] concisely summarizes the ups and downs of this intriguing and highly controversial field.

But I must correct your statement that I was brought onto the NAS panel to analyze reports of W. E. Howell's commercial rain-making projects. The first panel meeting I attended came a few days after Howell, who was distressed with a preliminary panel report, had given Malone several of his seeding reports for panel inspection. When Malone raised the question of what we should do with these company reports, I volunteered to have a look at them.

You indicated that no one could explain why certain reports which Howell had filed with the U.S. Weather Bureau library "hadn't reached the panelists' hands before". There was no reason why such reports should have reached the panelists' hands before, since it had never been the panel's mission to undertake a laborious analysis of commercial reports lying wholly outside the open scientific literature. It was actually two months after Howell met with Malone that Howell mentioned, in a letter to the panel, that those reports were in the Weather Bureau library. I cannot agree with any suggestions that filing such reports in the Bureau library comes anywhere near publishing results in carefully checked and fully documented form in the open scientific literature.

During the period 1950-1965, virtually nothing of scientific nature had been published in the literature as a direct result of any of the purely commercial rain-making projects in this country, a circumstance which contradicts any claims that the commercial seeders had established the efficacy of seeding long ago. As a matter of fact, the commercial operations that I analyzed, with the aid of an admirably impartial assistant, L. G. Nuttycombe, a philosophy graduate student now at the University of Washington, did give some very interesting indications of positive results. But the final report of our NAS panel took great pains to stress that nonrandomized cloud-seeding experiments are intrinsically inconclusive tests. So complex are the physiologies of natural clouds and so limited is our present knowledge of their inner workings, that we were only able to say that a variety of recent experimental results, plus the promising *indications* found in the analysis of the commercial projects, warrant a new degree of optimism and a new determination to step up the pace of research in this first major area of what may some day, far in the future, be a highly ramified field of weather modification.

JAMES E. MCDONALD,
Institute of Atmospheric Physics,
University of Arizona.
Tucson, Ariz.

IT WOULD BE ungenerous of me to pick at minor flaws in an article that so well portrays the general landscape of the subject today. But a few items are worth comment.

"When are you going to learn to stop irritating the raw nerve of Society?"

There is really no mystery to why Professor Gordon MacDonald's National Academy of Sciences weather modification panel didn't take a good look at commercial cloud-seeding results before publishing its preliminary report; the panelists knew perfectly well about this work but they did not consider it to serve their purpose. None of the reputable professionals in the field (who accounted for nearly all the commercial cloud-seeding done since the 1957 publication of the Advisory Committee on Weather Control report) had or pretended to have "trade secrets"; the fact is that our efforts to get our results published and seriously discussed were met with rebuffs that plainly told us our betters thought we were usurping the rostrum of science for our own money-grubbing and unscientific ends (*e.g.*, I have regularly sent copies of all my reports to the Weather Bureau library; up to 1957, these were abstracted in the *Meteorological Abstracts and Bibliography* along with other library acquisitions, but subsequently they were put aside unlisted). Several of the panelists were personally acquainted with most of the commercial cloud-seeders, and one member, Ralph Huschke, had recently co-authored a RAND study of commercial weather-mod activities. Besides, there was quite enough in the scientific literature—by myself, by Bob Elliott of North American Weather Consultants, by Arnett Dennis of Weather Modification Company, by Tommy Henderson of Atmospherics, Inc., by Perez Siliceo in Mexico, etc.—to document the importance of the experiences if not to prove conclusively the effectiveness of cloud-seeding, and render it inconceivable that the panel was unaware of this work or that the full results of it were inaccessible to the panel except as the panel chose not to turn to it.

W. E. HOWELL.
Lexington, Mass.

No Amateur

I QUESTION your characterization of Vincent Schaefer as an "amateur" when he discovered cloud seeding. At that time (1946) he had been a member of the American Chemical Society and a research associate on the scientific staff of the General Electric Research Laboratory for eight years. As the result of a brilliant series of scientific papers on surface chemistry, he had an enviable scientific reputation. Contrary to the implication of the article, Schaefer's cold box experiment was not an "accidental stumbling" but quite the opposite—a deliberately planned achievement of beautiful simplicity and scientific elegance. He brought nature's supercooled clouds into the laboratory where for the first time they could readily be studied. All of the apparatus necessary for this classic experiment had been readily available to scientists for several hundred years. Not until Vincent Schaefer did one have the wit to do what now seems obvious. "Amateur"? My eye!

BERNARD VONNEGUT,
Arthur D. Little, Inc.
Cambridge, Mass.

EDITOR'S NOTE: *SR's science editor is an admirer of Vincent Schaefer and has received generous help from him on repeated occasions. An accurate statement of Schaefer's discovery of the cloud-seeding principle would say, as Dr. Vonnegut suggests, that Schaefer was working on carefully planned experiments in cloud physics when he dropped dry ice into a malfunctioning refrigerator to speed the cooling process required for his work. The immediate formation of cloud crystals in the cold chamber was an instance of serendipity—an accident observed and correctly interpreted by a prepared mind—rather than amateurish stumbling.*

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THE MYSTERY OF THE BRAIN

IN BUILDING their new model of the early atmosphere of earth, Professors Lloyd V. Berkner and Lauriston C. Marshall postulate that complex biological organisms would have evolved on our planet only after enough free oxygen became available in the atmosphere to encourage respiration. Once an adequate fuel supply was available, they suggest, nature found ways to use the fuel—a circulatory system to convey the oxygen, a digestive system to employ it, and a nervous system to control the process.

The Berkner-Marshall model specifically includes *two* critical levels—the first when many different forms of multicellular life suddenly appeared simultaneously under the water all over the globe some 600 million years ago (oxygen was then one one-hundredth as plentiful as it is in our present atmosphere) and the second when life existed at or near the surface of the water with opportunities for the hardier forms to evolve ashore (the oxygen level at that time had reached about one-tenth the present atmospheric concentration).

As Professors Berkner and Marshall note in the description of their atmospheric model in preceding pages of *SR*, the great gaps in time that separate these two critical levels so puzzled Charles Darwin that he delayed publication of his theory of evolution.

Now it is too often neglected, outside textbooks on the evolutionary process, that Darwin was not alone in enunciating the theory that life on earth advanced through adaptation of species to changes that occurred in the environment. The idea of natural selection was shared by Alfred Russell Wallace, a British naturalist, who spent many years observing life on the islands of the South Pacific. And Wallace raised questions about the size of man's brain—as opposed to the size of brains of other animals—that may have new pertinence in the light of what Professors Berkner and Marshall have to say about oxygen as the critical determinant of evolutionary opportunities.

Wallace wrote on this question as follows:

> We see, then, that whether we compare the savage with the higher developments of man, or with the brutes around him, we are alike driven to the conclusion that in his large and well-developed brain he [the savage] possesses an organ quite disproportionate to his actual requirements—an organ that seems prepared in advance, only to be fully utilized as he progresses in civilization. A brain slightly larger than that of the gorilla would, according to the evidence before us, fully have sufficed for the limited mental development of the savage; and we must therefore admit, that the large brain he actually possesses could never have been developed by any of those laws of evolution, whose essence is, that they lead to a degree of organization exactly proportionate to the wants of each species, never beyond those wants in that no preparation can be made for the future development of the race—that one part of the body can never increase in size or complexity, except in strict coordination to the pressing wants of the whole. The brain of prehistoric and of savage man seems to me to prove the existence of some power, distinct from that which has guided the development of the lower animals through their ever-varying forms of being. . . .

Some of his contemporaries interpreted these observations to mean that Wallace was referring to the power of God. But Wallace himself explicitly denied this, and he died with his real meaning still unclear.

COULD the emerging supply of oxygen in earth's atmosphere fill the gap in Wallace's thinking?

Might there have been a *third* critical level in the availability of oxygen that would have encouraged the development of convolutions in the brain surface to serve as memory files, multiple-choice decision-making mechanisms, and computing facilities within the brain after the brain matter had evolved in a raw state in the skull's protective case?

Not very long ago it was believed, in light of the existing fossil record, that the human species did not appear on earth until a million or so years ago. Bones recently discovered in Africa have almost doubled man's apparent age—to 1.75 million years. Furthermore, the old supposition that only one strain of human-like ancestors would have preceded *Homo sapiens* has given way, under the evidence of modern research, to a belief that at least two and possibly three lines of pre-men existed more or less contemporaneously.

Tool-making, once considered the determining characteristic of the human species, has been established as a skill of lesser primates such as the chimpanzee.

In sum, the story of man has undergone extensive revision during the decade celebrated by this anniversary issue of the Science and Humanity Supplement of *SR*. Nevertheless, the length of his time on earth is exceedingly short, and all available signs continue to indicate that his first appearance was abrupt.

If Professors Berkner and Marshall are right in saying that other forms of life evolved explosively as increased amounts of oxygen became available in the atmosphere, must not this same explosive process be assumed to have governed the emergence of man?

SR's science editor suggested that I read what I could in the literature in pursuit of this question. I have found a number of interesting points.

The human brain requires vast amounts of oxygen. So essential is the oxygen supply to the brain's survival and functioning that a disruption can cause severe malfunctions within the brain in four seconds. This is the reason why experiments with artificial hearts—like the currently noted one in Texas—are so delicately balanced. Seymour S. Kety and colleagues some years ago studied blood flow and oxygen consumption of the conscious human brain in healthy young men (*Man and Civilization: Control of the Mind*, McGraw-Hill, 1961); one finding was that under normal circumstances the brain uses oxygen at the rate of 3.3 milliliters of oxygen per 100 grams a minute, which corresponds to 46 milliliters of oxygen per minute for a whole brain of average size. The authors measured this amount as a fraction of total oxygen consumption of the body; it came to 20-25 per cent.

W. Grey Walter (*The Living Brain*,

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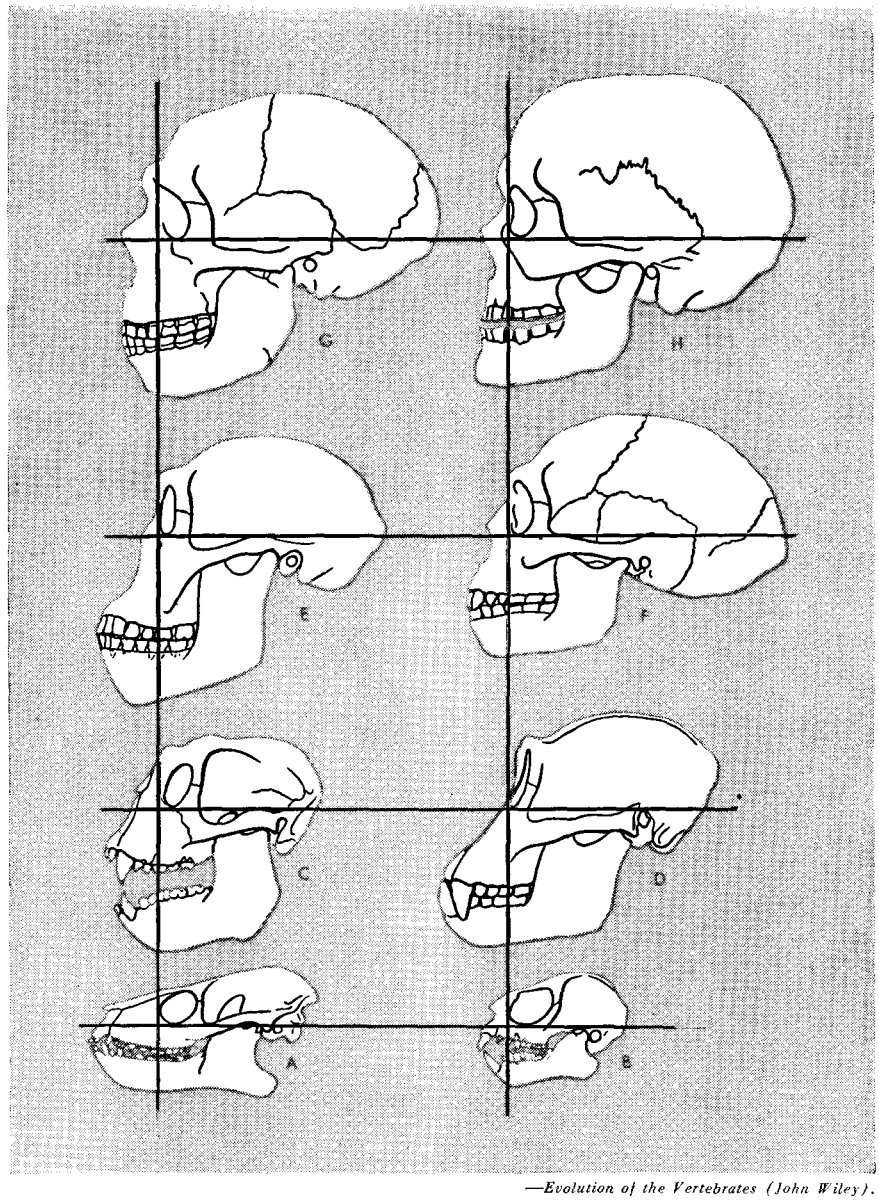
W. W. Norton & Co., 1953) has described what happens when the brain is deprived of its vital fuel:

> A man dying of coal-gas poisoning or exposure to a rarefied atmosphere rarely feels acute distress; when the oxygen in his blood is about half normal, he faints quietly and his brain may show a few minor disturbances but often none. Yet, if recovery occurs, the period of oxygen lack may leave traces for many days or for life.
>
> This is the Achilles' heel of the brain. Its need of oxygen and sugar is perpetual and exacting. Lack of sugar can signal, but not lack of oxygen. The agony of suffocation, the grasping and craze for air, is in fact due to the accumulation of carbon dioxide in the blood from the burning of body fuel, and this the human brain does feel, choked as it were by its own smoke, even though it cannot detect when the dampers are closing down.

All of the infinite advantages that man holds over other forms of life on earth emanate from the part of him that could survive the briefest span of time without oxygen. Because of his brain, man is unique in his ability not only to cope with but to influence his environment. His power of speech, his ability to communicate and exchange information, to learn from experience, to memorize and reason are attributes of the brain alone. Just when these faculties appeared, and in what order, are unknown. However, it is well-established that the human brain has increased greatly in size during the course of evolution of the species, and there is skeletal evidence of a change-over from a primitive smell-brain (relic of the days when clues to food and to the presence of danger had to be sought on the surface of the earth) to the sight-brain man began to utilize after he stood up and looked across the tall grass for his enemies or his prey. The Australopithecenes, the so-called man-apes that are believed to have preceded the earliest types of men, also depended on their eyes more than on their noses for information vital to survival. Yet the brains of the Australopithecenes were only a third as big as the brains of modern men.



—*Evolution of the Vertebrates (John Wiley).*

How primate skulls evolved to the point where they could hold man's brain. A: lemur-like animal; B: tarsier-like animal; C: extinct old world monkey; D: modern chimpanzee; E: Australopithecine; F: Pithecanthropus, or *Homo erectus*; G: Neanderthal man; H: cro-Magnon man.

WITH the help of his brain, man has performed prodigies of observation and analysis, devised codes of signals for the transmission of information, learned to verbalize the codes and then to put them in writing, and finally to build up a store of knowledge. From this storehouse of experience came the raw materials of culture and civilization. The individual who once faced the terrors of nature naked and alone at last had not only the combined strengths of the family or the tribe to protect him; he had the warmth of clothing against the cold and the wet, the protection of walls against storms and marauders, the security of law and order against the whimsical and the vicious.

Mastery of the environment, however, while momentarily convenient, has not always been directed with thought of the ultimate good of man as a species. Products of new knowledge and advanced technology have added to creature comfort and lengthened human life. Detergents have loosened dirt more efficiently, insecticides have saved acres of food crops, automobiles and airplanes have sped movement of people and cargo, antibiotics have controlled many forms of disease not otherwise manageable. But the killing off of microbes within the body has thrown off the balance of symbiotic relationships on which human health depends, motor exhaust has fouled the atmosphere, detergents have polluted drinking water, and insecticides have destroyed wild life without which man himself cannot live.

The breath of life is indeed fragile, and the reports that follow document the critical impasse to which man's brain has led him. Much attention has been rightly paid to the perils of nuclear radiation in terms of long-term effect on living cells and tissues. Much more will have to be paid to the damage man wreaks in seemingly simpler ways: in the clearing of land for real estate projects that leave the soil bare to wind and erosion, lower the water table, and destroy root systems of plants and trees, bushes and hedgerows essential to continuance of photosynthetic refueling of the atmosphere.

—JEAN F. CORWITH.

Jean Corwith worked with Dr. Lloyd V. Berkner during his presidency of Associated Universities, Inc. She is now assistant to *SR*'s science editor.

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PROTECT THE FRIENDLY MICROBES

By LaMONT C. COLE

DESPITE man's obvious domination over the life of this planet, his welfare and indeed his very survival depend upon many other types of organisms he knows very little about. Microbes, for instance, are as often friendly as they are hostile to man. But popular association of bacteria with disease distorts the truth. So far it has been plain good luck that man's bacterial benefactors have survived his alterations of the environment, and it would be foolhardy to trust to luck in the future.

Man's influence is now so widespread that a chemical like DDT has become virtually a normal constituent of soils and bodies of water throughout the world; it occurs in the snow on Alaskan mountains, in the fat of Antarctic penguins, and in other places where agricultural chemicals have no possible use. If DDT had happened to be a deadly toxin for some form of life upon which man's survival depends we should now be in desperate straits.

DDT was broadcast over the earth before being tested for its effects on the bacteria in soil and water. Similarly, spokesmen for the manufacturers of synthetic detergents admit that detergents flooded the market before anyone considered whether detergent residues could be digested and disposed of by microorganisms living in the water and in the soil where detergent wastes are discharged.

Fortunately, the detergent pollution problem was obvious enough to attract public attention. But a similar oversight with some future chemical compound might be an ultimate disaster for man even though immediate effects might be far from obvious.

As a simple example of man's precarious dependence upon a whole series of bacteria we may consider the cycling in nature of the element nitrogen.

Although the earth's atmosphere is over 75 per cent nitrogen by weight, and although this element accounts for about 2.5 per cent of the weight of a human body, on a global basis nitrogen is one of the genuinely rare elements. The limited supply of nitrogen molecules must be used over and over again by living things in order for life to continue to exist on earth.

The structural framework of all protoplasm (of which living things are composed) consists of proteins, which average in composition by weight about 50 per cent carbon, 22 per cent oxygen, and 18 per cent nitrogen. Oxygen is the most abundant of all chemical elements on earth, accounting for some 46 per cent of the mass of known terrestrial matter; carbon is relatively rare and contributes perhaps 0.03 per cent of the weight of known terrestrial matter; but nitrogen is far rarer and constitutes much less than one-hundredth of 1 per cent of the weight of the earth.

Roughly 90 per cent of the earth's nitrogen is in the atmosphere. This is the source from which organisms must obtain their nitrogen and to which nitrogen must be returned in order for the pattern of life on earth to continue.

HIGHER plants are unable to make direct use of the molecular nitrogen in the atmosphere. Most of them must get their nitrogen supply for protein-building from nitrates or ammonium salts, and man provides these indirect sources of nitrogen in the form of fertilizers. But under natural conditions, plants depend on certain bacteria and blue-green algae to convert the molecular nitrogen of the air to ammonia. This chemical conversion by the microbes requires a large expenditure of energy, which the most important nitrogen-fixing bacteria obtain by oxidizing organic compounds produced by the plants. So there exists an elaborate interdependence of various types of living things.

It has been known since the time of Theophrastus (372-287 B.C.) that leguminous plants such as alfalfa, beans, and clover could enrich poor soils and make them suitable for growing other plants in subsequent years. The transformation is accomplished in the roots of the legumes, which have on them swellings called nodules, containing nitrogen-fixing bacteria of the genus *Rhizobium*. The legumes furnish *Rhizobium* with organic matter as a source of energy, and the bacteria in turn furnish fixed nitrogen (that is, nitrogen in usable form) to the legumes and, incidentally, to the surrounding soil. Under favorable conditions legumes may in this way contribute as much as 200 pounds of fixed nitrogen to an acre of soil in a year.

Although higher plants can use ammonia as a source of nitrogen, this is not the usual situation. Several types of bacteria that are universally present in soils obtain the energy for their life processes by oxidizing the ammonia to nitrite. Then other ubiquitous bacteria obtain their energy by further oxidizing the nitrite to nitrate which is the form in which higher plants obtain most of their

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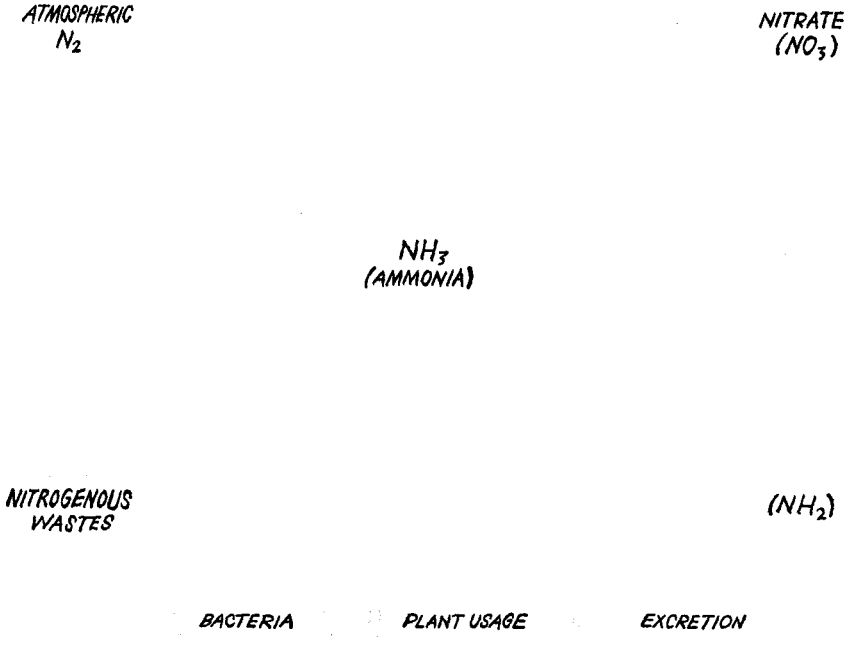

—Doug Anderson.

How bacteria cycle nitrogen on which all earthly life depends.

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nitrogen. This latter process is known as nitrification.

In the plant body the nitrogen is built into molecules of amino acids and the amino acids are linked together into huge protein molecules. An animal that eats the plant digests the proteins into their constituent amino acids, and then recombines the amino acids into animal proteins. Carnivorous animals that eat herbivorous animals again digest the animal proteins into amino acids and recombine those amino acids into protein distinctive to the carnivorous animal species.

Animals burn some of the protein in their food to obtain part of the energy needed for living. The waste from this process includes nitrogenous chemicals such as ammonia, urea, and uric acid, which the animals excrete. Plants can and do re-use excreted ammonia directly, thus acquiring more nitrogen. Some plants also can utilize urea directly as a further source of nitrogen. For the most part, however, animal excretions such as urea are not usable by plants until still additional types of bacteria have converted the waste back into ammonia.

WHEN plants and animals die, their nitrogen is tied up in proteins and in a variety of other organic compounds, some of which are chemically very inert. For example, the nitrogenous substance chitin is the principal component of the covering (exoskeleton) of all insects, spiders, shrimps, lobsters, crabs, and other animals classifiable as arthropoda. Chitin is absolutely indigestible for most organisms. If all the chitin in all the exoskeletons of all dead arthropoda were to remain as chitin, the nitrogen in earth's atmosphere would be exhausted in the geologically very short time of forty-two million years. It is indeed fortunate, then, for the perpetuation of life on earth, that some bacteria have been able to develop enzymes that will break down chitin and return its locked-in nitrogen to the life cycle.

Numerous other types of "decomposer" organisms also are necessary to insure that the nitrogen built into the bodies of plants and animals will be freed after death occurs in order to allow the creation of new life.

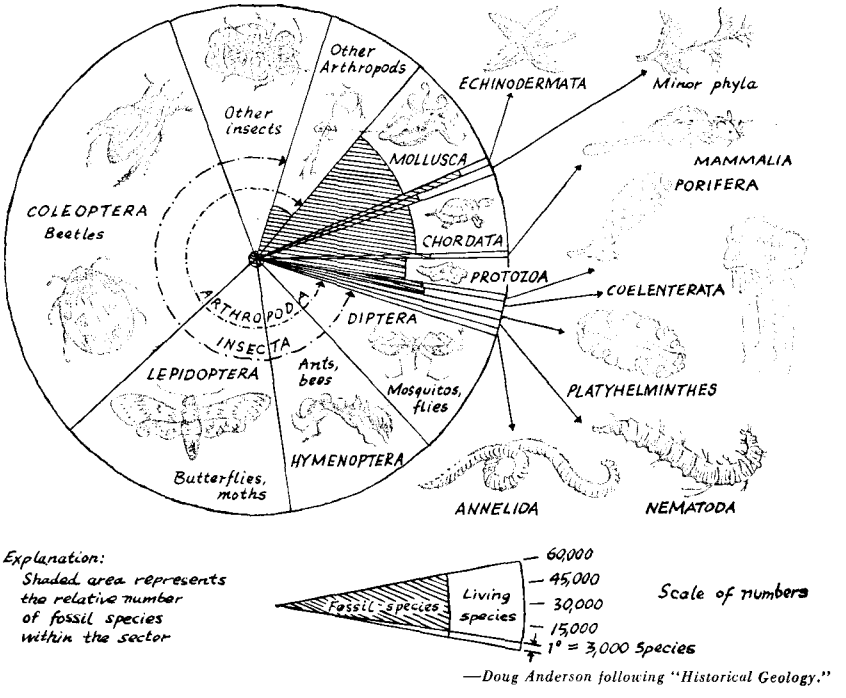
There is one other essential link in the terrestrial nitrogen cycle. The processes described up to this point have accounted for the conversion of molecular nitrogen to ammonia, for the conversion of ammonia to other types of chemical compounds, and for the breaking down of those compounds into ammonia again. But ammonia itself is a toxic substance. Man could not live on the earth if the molecular nitrogen in the atmosphere were to be replaced by ammonia. It is essential to life that there be some mechanism for regenerating molecular nitrogen.

The regeneration process is known as denitrification. Once again, bacteria carry it on. It occurs only in environments where oxygen is absent: in swamps, in deep soil, in the deep sediments on the bottom of lakes and oceans, and the like. Chemically, denitrification can be described as a form of respiration in which certain bacteria use nitrates instead of oxygen to burn the organic matter from which they obtain the energy for living. In the course of this combustion, molecular nitrogen is released.

Some molecular nitrogen is fixed in the upper atmosphere by the ultraviolet radiation of the sun and by flashes of lightning. But this inorganic activity is certainly not more than a few per cent of the nitrogen fixation performed by living organisms. In terms of the earth as a whole, microbial fixation may be on the order of a half-billion tons a year. Since annual plant growth requires at least ten times the quantity of nitrogen that is fixed annually, the vital importance of repeated re-use of the limited number of available nitrogen molecules is obvious, as is the necessity for protecting every step in the functioning of the nitrogen cycle.

Man has long been aware of the desirability of adding nitrogen to agricultural soils by growing legumes or treating the soil with manure or fertilizers containing nitrate. Nitrates are very soluble in water, however, and losses occur when water percolating through the soil carries the nitrates away. In recent years, it has been argued that ammonia is a better fertilizer than nitrate because ammonia tends to be adsorbed on clay particles in the soil and so is less subject to leaching. Proposals have even been made to find or synthesize a chemical capable of blocking the process of nitrification and so to reduce loss of nitrogen from leaching. Such suggestions emphasize the profound ignorance of even well-educated segments of society with respect to other types of organisms on which man's welfare and very survival depend. Without nitrification, denitrification would cease. Then it would take less than a million years at present rates to remove all of the nitrogen from the atmosphere. Man would become an extinct animal long before that process was completed.

Popular ignorance of ecology and the hesitance of political policy-makers to heed the advice of competent ecologists have already led man to experiment with some very questionable and locally disastrous manipulations of his environment. Recently man's influence on the environment has become so ubiquitous that a careless calculation might destroy or drastically alter the entire pattern of life on earth. The nitrogen cycle is only one of many complex natural systems through which man depends on other species of organisms for his existence. Nobody knows for certain how vulnerable to human blunders some of these systems may be. A species that presumes to dominate the earth and to name itself *Homo sapiens*, the wise one, can hardly take pride in remaining ignorant of the needs for its own survival.



—Doug Anderson following "Historical Geology."

Circle of life shows extent of death's lockup of nitrogen.

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DRAWING WATER FROM WASTES

By J. R. PORTER

WITH MORE than half the people of the world now suffering from hunger and serious disease, the ingenuity of man will be strained severely during the next thirty-five to seventy-five years if social and economic conditions are to be improved for the majority of the people of the world. We hear talk about sending citizens in spacecraft to distant planets to maintain the population balance on the earth. But we should realize that even at current levels we would need to put into orbit some 6,000 to 7,000 persons every hour of every day to maintain the balance—and this will grow to about 9,000 people per hour in less than ten years.

Microbiology can help in solving some of the ecological problems facing mankind, especially with regard to supplying food and clean water.

The earth's total water supply remains relatively stable, and the "water crisis" is perhaps more related to availability than to supply. About 93 to 98 per cent of the water on earth is unfit for drinking or irrigation because it is too salty or is frozen in glaciers or icecaps. The usable 2 to 7 per cent that remains is not only unevenly distributed, but man is rapidly depleting it and disturbing the normal distilling hydrological cycle. This is a result of urbanization and concentration of industries in our so-called supertechnical civilization. In doing this man has created deserts and waterlogged or salinized areas larger than all the irrigated lands of the world.

The total available fresh water supply in the United States is estimated to be 700 billion gallons per day. In the year 1960 we used on the average 320 billion gallons a day. Estimated use for the year 1980 is 560 billion gallons and for the year 2000 slightly under 900 billion gallons. Thus, it is imperative that something be done about water resources in this country and in areas of the world where less water is available.

We are told that soon nearly 50 per cent of our water needs can be filled by desalting the oceans. But if this procedure is to supply more than the fringes of the continents, tremendous technological developments and sources of power will be necessary to produce and to distribute the enormous quantities of water involved. For example, for each kilo of dry matter in green plants, some 150 to 225 kilos of fresh water is required.

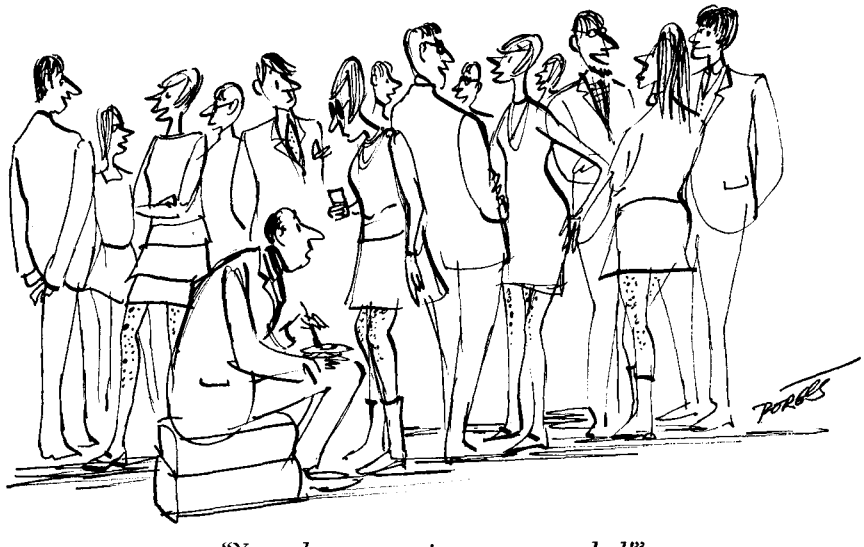
Microorganisms are most important in our water resources, not only for abating pollution but also for the equally significant recovery of water from sewage. Sewage must be purified if it is not to become a nuisance, injurious to aquatic life, and a danger to human health. But purification presents many problems of a microbial nature. Microorganisms develop rapidly in sewage, and they are capable of consuming their own weight in organic matter each hour. But they require large amounts of oxygen to oxidize organic matter completely to minerals. Because oxygen is soluble to the extent of only about eight to ten parts per million in sewage, and frequently ten times this amount is needed, oxygen often becomes the limiting factor in sewage purification. Additional problems have developed in the past few years with the discharge of synthetic chemicals from the home and industry into sewage systems. In 1965 over four billion pounds of synthetic detergents probably found their way into sewage in the United States. Many of these compounds could be degraded only very slowly by microorganisms.

In the future, it appears that sewage disposal through bacterial activity will have to be combined with oxygen delivery by means of algae. In 1965 Japanese scientists established the first small-scale, chlorella-growing sewage-disposal plant. Approximately 10,000 gallons (6,300 to 12,600 gallons) of purified water per day will be produced along with fifty-five pounds of dried chlorella, based on average weather and use of artificial light. The Japanese have pioneered in the development of purer sewage effluents by this method, and the by-product, chlorella, is a most useful animal feed, having a high nutrient value and vitamin content.

Various industries yield large quantities of waste water containing organic matter. In several countries in recent years, yeasts have been produced from the sulfite waste in the paper industry and from molasses, from whey distillery slops, and from pulp fluid of potatoes. The yeast strains *(Torulopsis utilis, Saccharamyces fragilis)* are rich in proteins, fats, and various vitamins, and are a valuable fodder supplement for animals. Even more important in some cases is that the fermented waste waters are useful for irrigation, whereas the unfermented waters have a harmful effect on soils. Conversion of such waste waters into utilizable products will relieve many industrial plants and municipalities of the serious problems of waste disposal.

The idea of using sewage and industrial wastes as an integral part of man's food-producing garden, and of recycling his drinking water, may seem obnoxious to many people. But the human race cannot afford to persist in practicing the present disposal system based on a maximum demand for water with a maximum of river and lake pollution. Whatever is done to improve the situation, microorganisms will have to be considered as participants.

J. R. Porter is chairman, department of microbiology, University of Iowa College of Medicine.



"Your knees are in my egg salad!"

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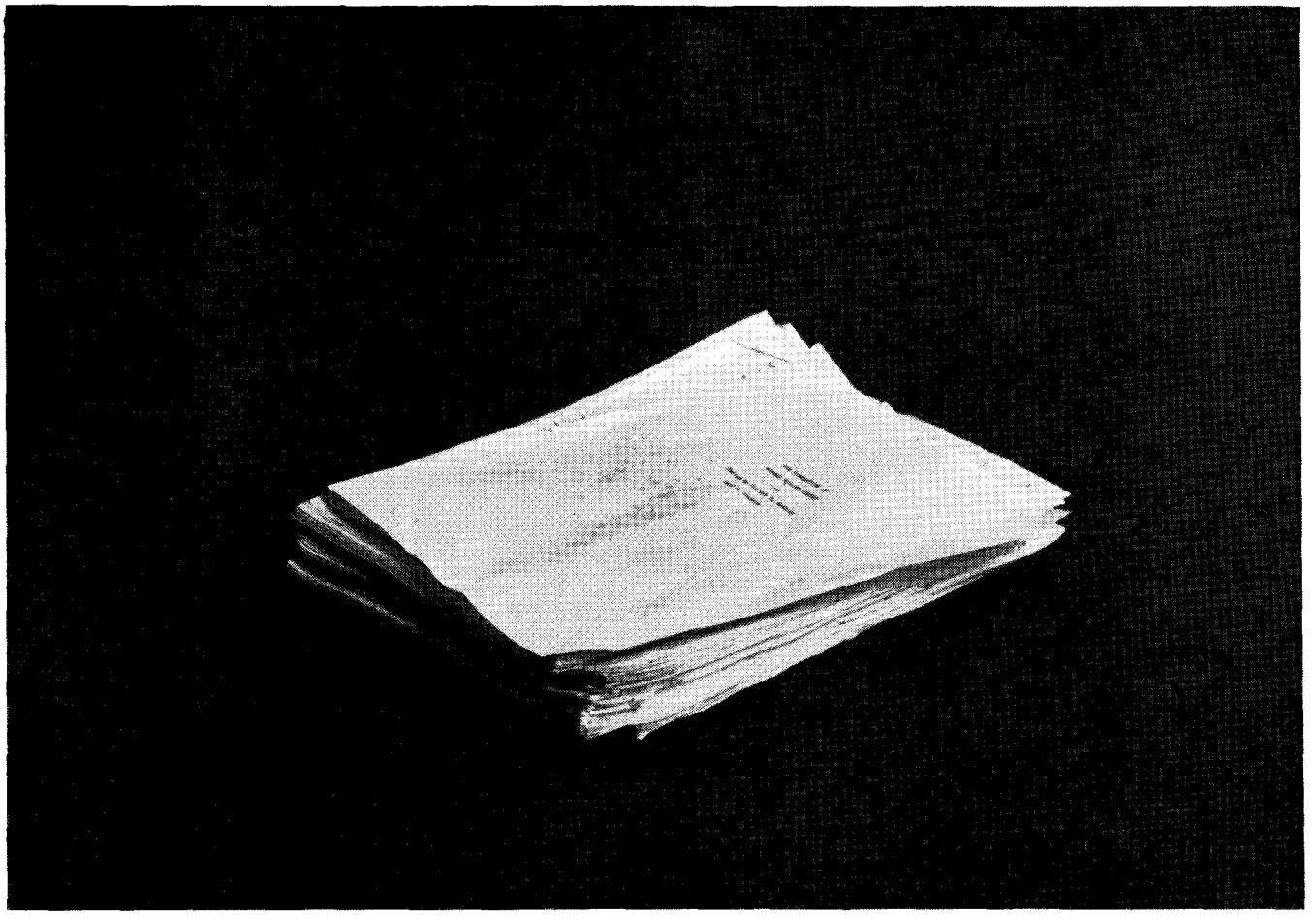

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PLANT GROWTH AS A CANCER CLUE

By SOLOMON GARB, M.D.

IT is well-known that plants compete with each other for sunlight, nutrients, water, and growing space. The mechanics of such competition involve several patterns. For example, fast-growing trees tend to shade smaller vegetation. Some plants with widespread roots take up ground water and minerals more readily than other plants. An additional mechanism of plant competition has recently been attracting increasing attention from scientists in several fields. Some plants apparently prevent the growth of competing plants by secreting chemical growth inhibitors. These inhibitors appear to be quite different in nature from inhibitors or anti-auxins which tend to regulate the plant's own growth patterns.

Apparently, the phenomenon of chemical warfare between plants is rather widespread. It is not confined to exotic species in far-away lands, but occurs in the common grasses, weeds, and trees of ordinary American gardens and farms. There is increasing recognition of the importance of understanding this phenomenon, not only as a fundamental factor in ecology, but also as a practical matter that affects lawns, orchards, farms, and may also affect the fate of nations and the development of new drugs for the cure of disease.

STUDIES done thus far suggest that most of the chemical warfare agents secreted by plants are not general toxins. Thus, the term "toxic" probably is not a good description of their action. Instead, they appear to be, for the most part, highly selective differential growth inhibitors which exert their effects even when well diluted in soil. The selectivity has two separate facets.

Most of the inhibitors tend to affect one set of plant species but not other species that seem closely related. For example, the black walnut tree (*Juglans nigra*) inhibits the growth of blackberry, among others, but not of black raspberry. Furthermore, a list of plants inhibited by the secretions of a particular species seems to be quite mixed, with no apparent relationship between the plants inhibited. For example, the black walnut is also reported to inhibit the growth of poverty grass, dock, common cinquefoil, red and white pine, apple trees, potatoes, tomatoes, asparagus, alfalfa, hydrangea, lilac, and chrysanthemum. Undoubtedly some biochemical feature is common to the inhibited group and not to other groups, but as yet no information is available on this point, nor am I aware of any current studies on it.

A second aspect of the selectivity of the chemical inhibitors is their effect on different parts of the victim plant. Some of the inhibitors, including those found in tonka bean, sweet clover, and mountain ash inhibit root growth. The tops of the victim plants apparently grow normally for a short time and then die abruptly. When dug up, they are found to have tiny, stunted roots. Other inhibitors apparently affect the leaves primarily, and some inhibiting secretions of grasses affect roots and foliage of other grasses.

THE source of the growth inhibitor differs with different plants. Some apparently are produced in the roots and spread out in the soil. The black walnut is believed to be an example of this type. Some plants such as *Encelia farinosa*, *Bergenia crassifolia*, and *Artemisia absinthium* (wormwood) have an inhibitor in the leaves. When the leaves fall to the ground and decompose, they release the inhibitor, which keeps other plants from growing for a prolonged period. Seeds and fruits are also sources of inhibitors. As the inhibitors leach out into the soil, their action provides a small, safe zone in which the seedling can obtain a vital start in its growth. A few plants of genera *Salvia* and *Artemisia* secrete volatile growth inhibitors. The vapor apparently condenses into dew, and the dew inhibits growth of competing plants.

The actions of the growth inhibiting chemicals fall into two general groups. Some inhibit growth of plants of other species. They are referred to as heterologous inhibitors. Other inhibitors act on plants of the same species and are referred to as homologous. As a general rule, the homologous inhibitors are more likely

Dr. Solomon Garb, a physician who has specialized in drug effects, is associated with the University of Missouri.

"A man can really fight for humanity in a place like this."

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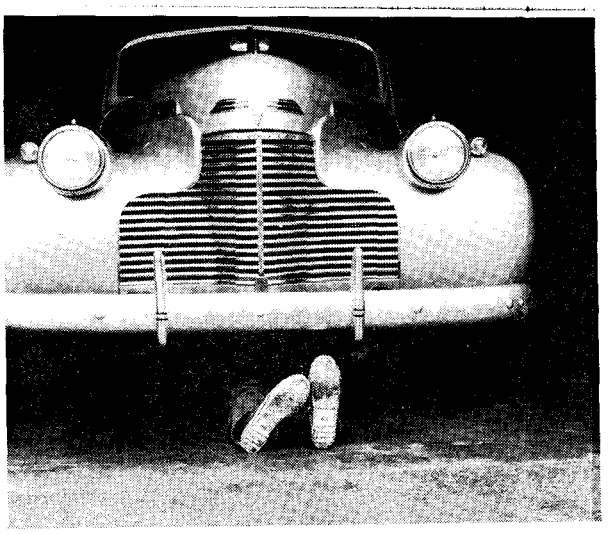

Art Mayer–self-taught mechanic now teaches at a GM Training Center

He was the happiest boy in town when he landed a part-time job at the corner gas station. He wanted to be a mechanic for as long as he could remember. He wanted to learn all he could about cars and engines. And this was his big chance. He turned his part-time job into a full-time ambition. He never lost the desire to work on engines . . . or to learn more.

After serving as a helicopter mechanic during the war, Art joined one of the General Motors car divisions as a mechanic and soon worked his way up to Master Mechanic. Today, Arthur E. Mayer, Jr., is an instructor at one of 30 GM Training Centers across the nation, with a total annual enrollment of some 125,000 automotive mechanics drawn from GM retail dealerships. The "refresher" courses taught at these centers keep local dealer mechanics constantly abreast of new advances in technology and service methods.

Art Mayer is happy working with his students, helping to advance their knowledge and skills. He's a fine example of the kind of people that make GM go.

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to be found in less fertile habitats such as deserts, where lack of crowding has great survival value. The effect of the homologous inhibitors therefore resembles the end effects of territoriality behavior in animals, an interesting example of the breadth of ecological principle.

The chemical structures of growth inhibitors do not follow any consistent pattern. A corresponding lack of similarity in chemical structure is noted in antibiotics, which are also differential growth inhibitors.

To my knowledge there have been no controlled studies to find out whether the inhibitors are produced in equivalent amounts during all phases of a plant's life, or whether they are produced in much greater amounts during certain times, such as budding or flowering. However, some general observations suggest that the production of inhibitors may relate to certain phases of the plant's life cycle.

In some cases, specific ecologic patterns may be explainable on the basis of differential growth inhibitors. The single stand consists of a large number of plants of the same species, growing in the same area, without any plants of different species. In the past, attempts were made to explain this pattern on the basis of superior adaptability to a particular habitat. However, in similar habitats, one may find a single stand of another species, or a mixture of many plants. On the other hand, if the species in a single stand secretes a broad-spectrum growth inhibitor which is heterologous, it could produce a single stand once its density on the land exceeded some critical level which resulted in a concentration of inhibitor greater than that which could be withstood by the hardiest competitors.

A second interesting ecologic pattern, the "fairy ring," has been explained as due to growth inhibitors. The "fairy ring" pattern consists of a central flower, surrounded at a distance by a ring of similar flowers, all separated from each other. At times, the central flower may have disappeared. The most fitting explanation for the "fairy ring" is that the central plant is the oldest, and that it has produced a homologous growth inhibitor which prevents any plants of the same species from growing within a certain radius. Plants outside that radius, however, could grow and flower.

The composition of plant communities, another area of considerable ecologic interest, is also probably influenced by the differential growth inhibitors, as well as by the usual environmental factors.

There are important agricultural consequences of the actions of the differential growth inhibitors. The deleterious effect of weeds on crops has been known from the beginnings of farming. However, the conventional explanations have not been satisfactory. It has been stated that weeds remove from the soil water and essential nutrients, and thus inhibit the growth of the desired plants. However, some reflection on this explanation indicates its deficiency. Weeds tend to be quite efficient in their usage of nutrients and water; otherwise they could not survive in the poor quality soil in which they are frequently found. The net mass of a weed is seldom as great as the mass of the desirable plant with which it competes. Nevertheless, a scattering of weeds in an area can reduce the yield of a crop considerably.

AN explanation that fits all the known facts is that the weed secretes a differential growth inhibitor that slows the growth of the desirable plant.

It should be noted that crop plants may themselves produce heterologous growth inhibitors. In some cases, the inhibitors are rapidly destroyed by soil bacteria. However, several inhibitors are known to persist in the soil for many years. This may explain why a change from one crop to another may at times result in poor yields. A residue of inhibitor from the first crop may affect growth of a subsequent different species.

The composition of lawns probably depends to a large extent on the effects of growth inhibitors. The relationships are complex. It is reported that Kentucky bluegrass inhibits growth of Canada bluegrass, but in turn is inhibited by redtop. Timothy is also reported to be inhibited by redtop, but is not inhibited by clover which does inhibit Kentucky bluegrass. Commercial mixtures of lawn seeds do not apparently take these factors into account, so that the eventual composition of a lawn may have quite different proportions to the initial seed mixture.

The differential plant growth inhibitors are of great actual and potential importance in medicine. Some of our most useful medications (the antibiotics) are differential growth inhibitors produced by one species of single-celled plant which inhibit the growth of other single-celled forms of life—that is, bacteria. Although all antibiotics in chemical use come from single-celled plants, there is good reason to believe that the higher plants also produce antibiotics. However, since the single-celled plants can be grown so much more rapidly in culture media, they are the most practical sources of the large amounts of antibiotics needed in clinical medicine.

It is noteworthy that although some medical antibiotics actually kill bacteria, most do not. Instead, they inhibit the growth, metabolism, or multiplication of the bacteria. As a result, the ecologic balance between host and bacterial invader is altered in favor of the host, and the latter's basic defense mechanisms are then able to destroy the invaders.

There has been considerable interest in the possibility of finding among the differential plant growth inhibitors one or more which will inhibit the growth of cancer. There are both theoretical and observational reasons to support such a hope. The fundamental biochemistry of animal cells is based on the biochemistry of the plants on which all animals live, directly or indirectly. Many plant materials are known to have profound effects on animal cell functioning even in tiny doses, and such effects are usually quite specific. Examples are atropine, digitalis glycosides, tubocurarine, and ergotamine. Atropine in a dose of 1 milligram will exert specific actions on some parts of the body of a seventy kilogram person—a final dilution of 1-to-70,000,000.

This is not to imply that the medications mentioned above are differential growth inhibitors. They probably are not, and indeed we do not know what function they serve in the plant. However, they are examples of the potency and selectivity of plant materials in relation to effects on animal cells.

Only a few of the plant growth inhibitors have been studied for effects on the growth of animal cells, but these studies have been most encouraging. Some plant growth inhibitors have a rather broad spectrum of action against animal cells. Protoanemonin from *Anemone pulsatilla* has been reported to inhibit rapidly multiplying cells of all sorts—plant and animal—but not resting cells. It might seem that such a material would be a good anticancer agent, but it probably is not, because cancer cells are not predominately rapidly multiplying.

THIS brings up a fundamental point about cancer which should be clarified if the search for an anticancer medicine is to be understood clearly. Cancer has, in the past, been widely considered by both physicians and laymen as a disease in which cells multiply at very rapid rates. To be sure, the rate of multiplication of cancer cells does seem exceedingly rapid to the unfortunate victim and his family. However, by comparison to the multiplication rate of certain normal, vital cells, cancer multiplication rates are not rapid at all.

Some illustrations may be helpful. The cells of the bone marrow in normal persons multiply at a rate sufficient to produce 2,500,000 red blood cells *every second* for a life time. After hemorrhage, this rate may increase five to seven times. In the course of a year, the bone marrow of a normal person will produce approximately eighteen pounds of red blood cells. Other cells essential to life also multiply at rapid rates. Most of the lining of the gastrointestinal tract replaces

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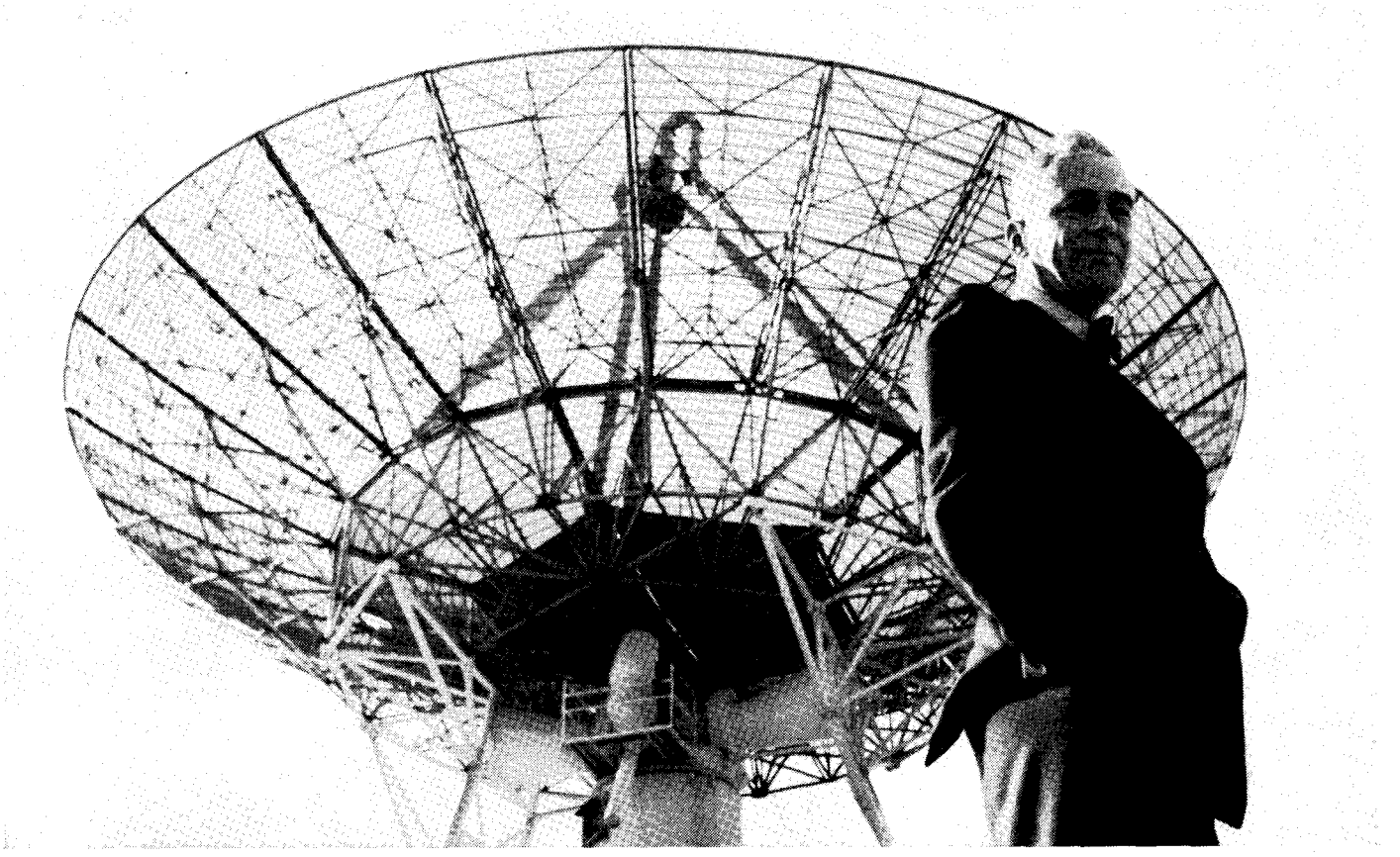

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Mr. Sullivan is the perfect guide. He's right at home in the rarefied atmosphere of science and exploration. He's been on five polar expeditions—three south, two north—and has a 15-mile-long Antarctic mountain range named after him. He's also on the governing boards of several science groups, including the American Geographical Society.

His ability to *explain* science has also been honored. Among his many awards is one from the American Association for the Advancement of Science for writing on the natural sciences. And last year he won the International Nonfiction Prize for his latest book, which examines the possibility of life existing on other worlds. It is called "We Are Not Alone."

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itself in a period of less than a day. Even the cells lining the mouth multiply at faster rates than most cancers. It is a fairly common experience to cut or scrape the mouth lining while chewing, and then to discover advanced healing in less than a day.

Since many normal cells multiply at such rapid rates, it follows that a broad-spectrum growth inhibitor that affects all rapidly multiplying cells would affect these normal cells, too. Since at least two types, those in the bone marrow and those lining the gastrointestinal tract, are essential to life, a broad-spectrum inhibitor of any origin would kill the patient at a smaller dose than that needed to completely control the cancer. This principle accounts for the undesirable side effects of gastrointestinal bleeding found with many of the anticancer drugs in use today.

PARENTHETICALLY, we may consider whether or not cancer cells multiply more rapidly than the normal tissues from which they are derived. Often they do, but not always. For example, a skin carcinoma may grow more slowly than normal skin. The distinguishing feature of cancer is not its rate of growth but its ability to invade normal tissues and to metastasize.

A material which selectively slows the growth and multiplication of cancer cells might not "cure" cancer in the sense that surgery cures appendicitis, but it could arrest the disease sufficiently to allow the patient to live normally for a full life span as insulin does for diabetics. Accordingly, a differential growth inhibitor, which exerts a much greater effect on some cells than on others, appears to be a promising target for cancer research.

There is already some evidence of the existence of plant growth inhibitors that exert a differential effect on animal cells. Parasorbic acid obtained from the ripe berries of the mountain ash inhibits multiplication of animal cells of fibroblastic origin in concentrations much lower than those needed to inhibit multiplication of epithelial cells.

There have also been reports of several plant growth inhibitors that cured transplantable tumors in mice and rats. Such reports must be considered most cautiously for several reasons. The transplantable tumors of rodents, despite their widespread use in cancer research, are not exact duplicates of human cancers. Spontaneous animal cancers, which are much closer to the human disease, are unfortunately seldom used in cancer research because of the expense and difficulty they entail. Furthermore, it is not uncommon to read a report describing the excellent effects which a plant extract has had on a group of transplantable rodent cancers, and then to find no further reports of follow-up studies. We don't know if the follow-up studies were unreported because they turned out badly, or whether they were never performed because the investigator was unable to obtain sufficient research funds to follow up his original observation.

Several groups of investigators have been studying the effects of plant extracts on cancer without reference to any possible relationship to plant growth inhibition. The reports of their initial experiments indicate that a substantial proportion of the plant extracts studied had some inhibiting effect on tumor growth. It seems significant that several of the plants found to inhibit tumors also are known to secrete plant growth inhibitors. *Euphorbia* and *Trifolium* are examples. In several additional cases, one species of a genus was reported to inhibit cancer growth, but wasn't tested for plant growth inhibition effects, while another species of the same genus was reported by other investigators to produce a differential plant growth inhibitor but wasn't tested for effects on cancer. Examples are the genera *Anemone* and *Prosopis*. We do not yet know whether the proportion of differential growth inhibitors among the plants which also affect cancer in animals is higher than could be expected on the basis of chance alone, but I strongly suspect that it is.

The overall research effort on the effects of plant extracts on cancer deserves considerable attention. A number of investigators both here and abroad have studied the effects of plant extracts on tumor growth, and their reports have, in general, been encouraging. In general, investigators screening plant extracts for antitumor activity find a higher proportion of positive leads than are found in the screening of synthetic chemicals.

THERE has been a vigorous national screening program of synthetic chemicals for anticancer activities, with over 40,000 different chemicals screened, and very few, if any promising leads developed. Less than 10 per cent as many plants have been studied. It is difficult to understand why the study of plant materials for anticancer activity has not been better supported by government agencies. It cannot be argued that the plant materials would be synthesized anyway. Many medications of plant origin, whose structural formulae are known, cannot be synthesized with our available techniques. The digitalis glycosides are excellent examples. The study of plant extracts for anticancer activity is one of several aspects of cancer research severely handicapped by a chronic shortage of funds. This is difficult to understand when two extracts from the common periwinkle plant, vincristine and vinblastine, have already been shown to be helpful in some human malignancies.

The number of trained investigators in the nation today is sufficient to increase our national research effort on plant extracts in cancer by a factor of ten to thirty times without handicapping any other vital programs. The potential role of botanists in cancer research is much greater than their current participation would suggest.

In the search for a satisfactory treatment for cancer, it will be helpful to think, not in terms of a magic bullet which will kill all cancer cells without killing the patient, but in terms of agents which can modify the complex ecologic balance between tumor and host in favor of the host.

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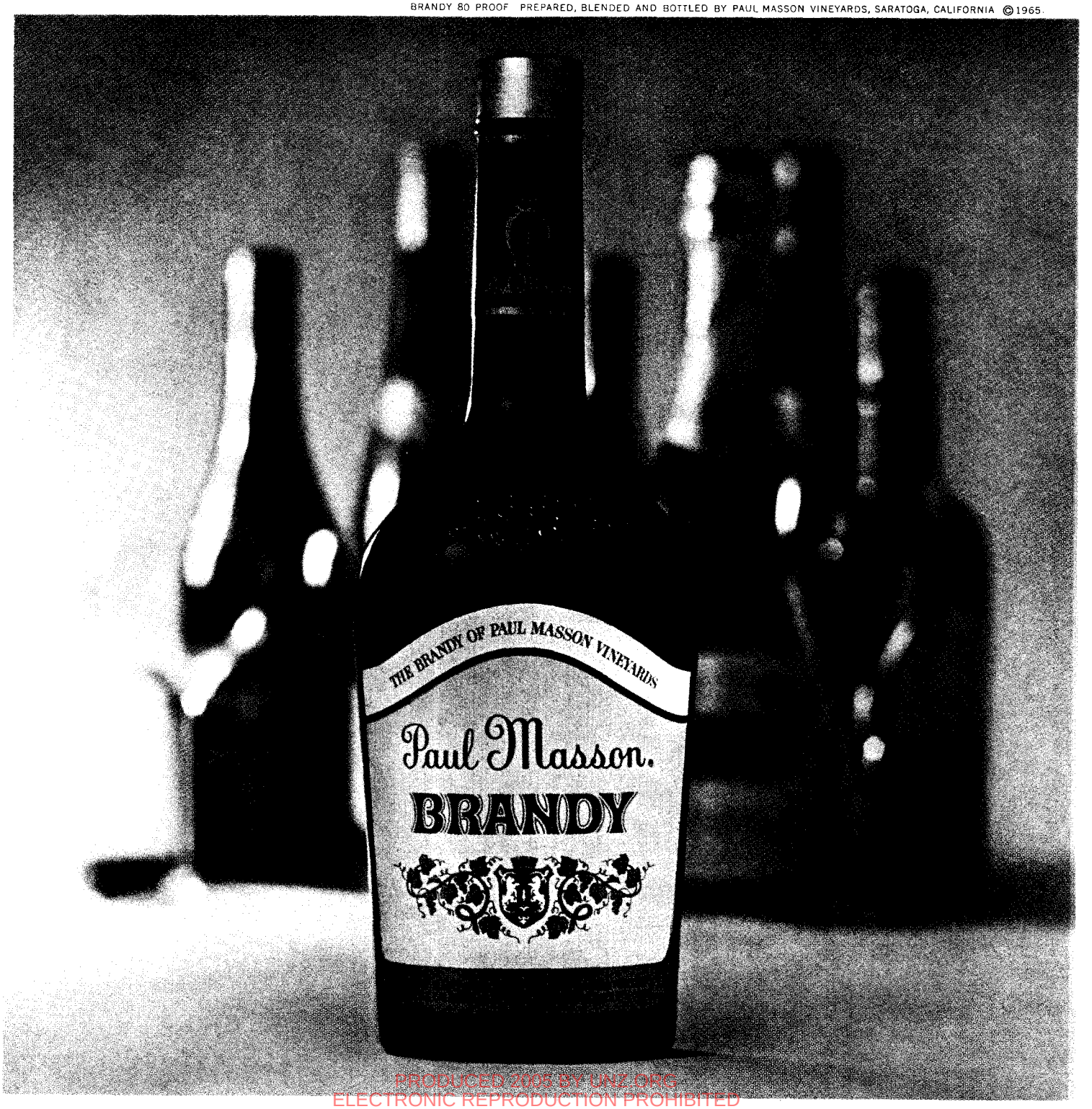

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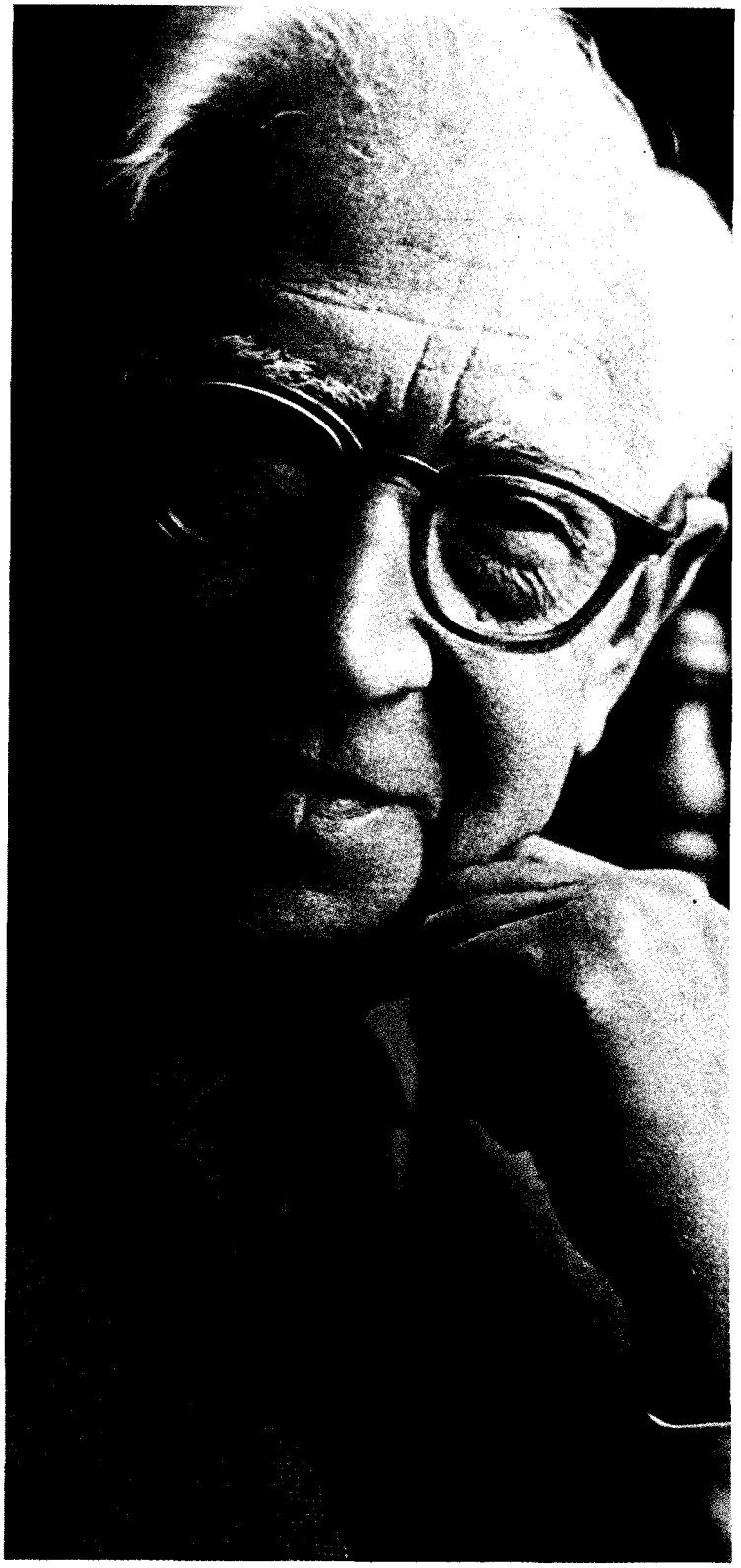

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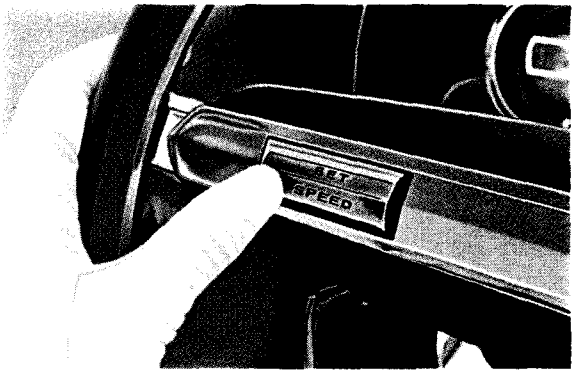

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—*NSF.*

Microbiologists hunting answers to the riddle: How does life survive in Antarctic cold?

THE FRAGILE BREATH OF LIFE: HOW TO KEEP IT GOING

BY STUDYING NATURE WHOLE

By LELAND J. HAWORTH

THE New Yorker reading with furrowed brow about the water shortage or the Californian expressing uneasy concern about smog may detect little relevance between these immediate problems and the work of a biologist on some faraway mountaintop. Yet the relationship exists, however indirectly and tangentially. Indeed, the findings of environmental biologists may have an important bearing on creating the conditions necessary for man's long-range survival.

Here in the mid-1960s, man's relationships with his environment have become a matter of greater concern than ever before. Water and air pollution are compelling examples. And biologists, geographers, historians, and sociologists point to a growing and convincing assembly of data to indicate that the earth's frontier of its untapped natural resources—renewable and nonrenewable—is rapidly disappearing under the combined impact of population increases and human demands for a greater share of what is available.

Dr. Kenneth Boulding, economist at the University of Michigan, has likened the earth to a manned spaceship traveling through space and time with a limited store of resources on board and receiving a circumscribed input of energy from the sun. The permissible rate of consumption for maintaining life of the occupants of a spaceship obviously cannot exceed the regenerative capacity of the ship. Similarly, if man is to endure on the larger spaceship called earth, he must one day achieve a more rational kind of steady state in which pollution is matched by purification, and consumption of resources is matched by replenishment of resources.

Man must therefore perfect his ability to know in advance the effects of his activities. Only in this way can he provide himself with the options necessary to adjust his ecological system. As the environment becomes less and less able to meet the increasing demands put upon it, the ability to forecast becomes an increasingly high priority matter in the natural, behavioral, social, economic, and political sciences.

In such a setting it is understandable that the word "ecology" has in the past few years been carried from the cluttered desks of a small number of scientists into the magazines, newspapers, and daily speech of the public. Ecology has its roots in the biological sciences, where environmentally oriented biologists have been seeking answers to questions dealing with man's physical surroundings.

How is it possible, for example, for so many biological species to share the same bit of real estate? What regulates natural population densities? Why do old and complex biological communities seem to remain stable and use so efficiently the resources of energy and materials available to them? Why do some of these communities become so unstable when disturbed even slightly by man, while others do not? What useful lessons can be learned from paleoecology, the history of past groupings of biological organisms as reconstituted from fossil remains, and what effect, if any, did human interference have on the recorded changes?

The urgency surrounding many of our current environmental problems has generated active interest at the highest

Leland J. Haworth, a former member of the U.S. Atomic Energy Commission, is now director of the National Science Foundation.

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levels of government. As a result, the National Science Foundation, holding primary responsibility in the government for support of basic scientific research, has provided support for many of the nation's scientists in seeking answers to these and related questions.

For example, interdisciplinary research is being done with NSF assistance at biological field stations for the study of wild life in its natural habitat. One of these is the unique University of Oklahoma Biological Station on Lake Texoma, one of the largest man-made reservoirs in the United States, with more than 700 miles of shore line.

Lake Texoma provides many unusual opportunities for biological experiment. Because of deposition of sediments and encroachment of plant life upon the shores and into the bottom areas, the anticipated life span of the lake is relatively short—seventy-five to 100 years. Thus it will be possible to study comparatively rapid changes in biological systems. At the present time the situation provides research and study opportunities to about 125 scientists each year in such areas as taxonomy, ecology, natural history, behavior, and those phases of evolution, morphology, and physiology that require extensive and intensive study of organisms in their wild state.

Two other specialized field stations also deserve mention.

The beautiful gorges of the southeastern Blue Ridge escarpment near Highlands, North Carolina, contain biologically diverse plant and animal populations. The gorges constitute an altitudinal transition between the flora and fauna of the piedmont and coastal plain provinces, and those of mountainous areas in the southeastern United States. For these reasons the Highlands Biological Station is conducting a long-term study of the ecology of the escarpment gorges.

The Devon Island Expedition, initiated in August 1960, is similar in that it represents a coordinated multidisciplinary approach to the study of a single key geographical area. The intent of this study is to understand a single area—in the archipelago bordering on Baffin Bay—in depth and thereby to develop broader insights into the dynamics of Arctic regions, as well as to advance oceanographic science generally.

In contrast to these wild state studies, NSF has assisted in the support of a limited number of controlled-environment facilities. The biotron of the University of Wisconsin, now nearing completion, will be the largest and most sophisticated such center in the world. Its controlled spaces include extensive animal and plant rooms, a wind tunnel, controlled humidity rooms, a high-intensity light room, and many others.

The types of problems to be investigated cover a wide range of physiological, ecological, pathological, climatological, and other interests. Among those under consideration are the relation of environmental factors to the biosynthesis and activity of specific hormones that regulate size, form, and reproduction in animals and plants; the role of the environment in determining patterns and other aspects of behavior; and the biochemical and physiological results of exposure of organisms to air pollutants.

A two-unit regional facility of the controlled-environment type is the phytotron now under construction on the campuses of North Carolina State University at Raleigh and Duke University at Durham. The unit at Raleigh will provide specially quarantined areas for maximum protection against cross-contamination by pathogens or insect pests. The unit at Duke will accommodate numerous small rooms, high light intensities, and high-ceiling chambers to accommodate trees and tall plants like maize.

NSF conceives of environmental biology as a broad field, covering or impinging upon many related areas of biological interest. In marine biology, for instance, many exciting research projects are in progress.

For example, the work of Dr. Howard Saunders of Woods Hole Oceanographic Institution—on the biological content of bottom ooze in deep oceans—has shown that what were thought to be biological deserts sustain as many species per unit volume as almost any other area on earth.

Three other scientists working with NSF support—Dr. Gordon Riley (then at Yale) and Drs. E. R. Baylor and W. H. Sutcliffe of Woods Hole Oceanographic Institution—have studied the formation in the oceans of particulate organic matter from dissolved organic molecules, and have reached the conclusion that this matter comes from the plankton and forms into flakes at the sea-air interfaces. The flakes (which are thought to be the "marine snow" often reported but never understood by bathyscaphe operators) carry bacteria intimately associated with the processes of particle formation. Both the particles and the dissolved organic matter represent a hitherto unknown and so far unevaluated food material in the marine food webs.

Tagging turtles in advance of transatlantic migration.

—NSF.

IN the field of fresh-water biology, Dr. W. T. Edmondson of the University of Washington has meticulously documented since the 1950s the biological and chemical changes associated with the spoiling and subsequent rejuvenation of Lake Washington, a twenty-mile body of water east of Seattle. His work is becoming an international classic for understanding the recovery of a lake following pollution abatement.

Over much of the habitable earth, the countryside is increasingly being cut up into small islands bounded by farms, urban communities, suburban shopping centers, and interstate highway systems. There is no reason to anticipate a reversal in this checkerboard trend of human expansion, and we do not know the minimum size at which a natural ecological unit can sustain all of its component species.

Dr. R. H. MacArthur of Princeton University and Dr. E. O. Wilson of Harvard, studying the fauna of natural

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islands, find that the differences of richness in species on otherwise similar islands can be attributed to factors influencing the equilibrium level between immigration and extinction on the islands. They have paid particular attention to the birds and insects of the Pacific islands. From theoretical calculations they have shown how it would be possible to more than double the numbers of species on isolated islands by a slight artificial increase in the immigration rates.

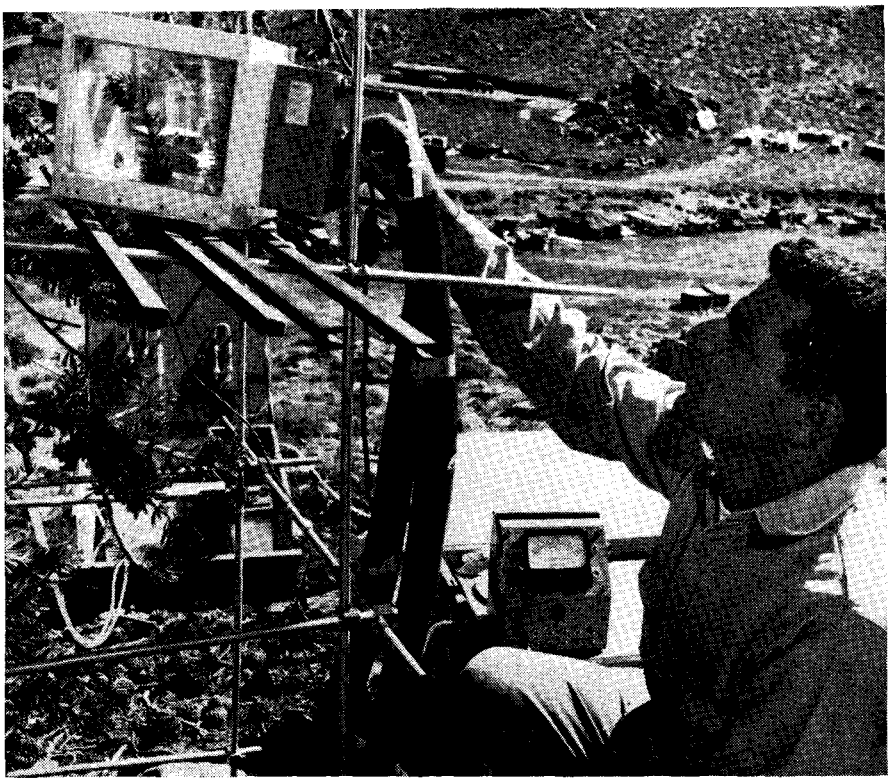
An equally important objective is to find a scientific basis both for preserving species from extinction and for understanding how to maintain healthy, harvestable species in forestry, grazing, fisheries, and wildlife. A large number of studies are in progress on such matters as predator-prey relationships, population regulation, and the physiological bases of drought, heat, cold, or pest tolerance. The recycling of inorganic nutrients between the web of living organisms and the nonliving environment also is a topic of great interest.

Because of the growing contribution of physical scientists to understanding the complex interdependencies of the biological environment, NSF late last year established within itself a division of environmental sciences. This new division embraces the atmospheric sciences, the earth sciences, and the special national research program in the Antarctic. Environmental biology generally was not included because NSF's activity in that area is traditionally focused on "biology" rather than on "environment"; however, the synthesis of all these directions of research support may be seen in the program for Antarctica.

Buried beneath the now desolate Antarctic ice cap lie the remains of once flourishing forests and seas. Petrified tree trunks, leaf imprints, coal seams, and crustacean remains have been found, indicating that millions of years ago the Antarctic climate was temperate. This means either that the earth's climate has changed drastically, or, more probably, that Antarctica was not always at the bottom of the earth. Either the pole or the continental mass has shifted. Questions of this kind illustrate the intimate connection between biology and other environmental sciences—in this case, geology.

North of the continent of Antarctica is an oceanic environment. Within this zone lies a phantom coast of pack-ice and an almost inconceivable richness of sea life about which relatively little is known.

On the continent itself, the small areas that remain clear of ice and snow are rugged, austere, and inhospitable. Low temperatures challenge life even during the summer period of full sunlight. To survive, organic life must endure winter temperatures often lower than 77 degrees below zero. Vegetation is sparse, and insects dominate the local fauna. The fact that plant and animal life can survive at all under such conditions is of obvious interest to ecologists.



—*NSF.*

A California pine cone gets a custom-built living room.

THE future course of life on earth necessarily depends on the planet's young people. How many of them are prepared or can be encouraged to become active, practicing environmentalists?

For the current fiscal year, NSF's environmental biology program carries research grants for about 450 research assistants. More than 85 per cent of these are students seeking advanced degrees; about half of them will go on to doctorates. In addition, there are more than 100 NSF-supported research associates (at least half of them post-doctoral), sixty-five undergraduate assistants, twenty-two research assistants under direct research-training grants, twenty to thirty research fellows, and approximately a dozen research trainees. From these various categories, NSF assists in the education of between fifty and sixty Ph.D's in environmental biology who are added yearly to the scientific manpower pool.

At lower levels in the educational system, NSF operates both to increase the number of young people interested in the possibilities of environmental biology as a career and to increase the number of students who, though choosing other careers, are well-informed about the rudiments of environmental biology. These efforts include support for up-to-date biology textbooks and updating courses for high schools.

In ways such as these, the important problems of our environment and its effects on animal, plant, and human life are being brought to people at every level. Popular support is thus generated for creative technology and applied research to attack the visible problems man has created for himself in modifying his environment in the name of progress. But even crash approaches to the known and the identifiable may prove inadequate to meet new and unforeseen problems as they appear over the edge of the horizon.

It seems clear that basic research, the quest for fundamental knowledge, must be further stimulated. Obviously we cannot know what fundamental breakthroughs in the social sciences, the physical sciences, the earth sciences, or the biological sciences will provide major advances in our continuing concern with environmental quality. Expenditures for basic research must be made on faith, but such faith has brought us rich returns in the past and can be expected to do so again in the future. And just as we do not know which items of fundamental research will provide the keys to unlock the future, neither do we know whether any particular key will be turned by the physicist, the biologist, the chemist, the social scientist, or the engineer. The magnitude of our ignorance of ecology, and the opportunity to dispel it, appear to guarantee a bright future for all who are attracted by the challenges of environmental biology.

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BY SIMULATING CATASTROPHE

By ROBERT M. WHITE

RECOGNITION of the need for confronting our planetary environmental problems on a planetary scale resulted last year in formation of a new Environmental Science Services Administration (ESSA) in the Federal government. Set up within the U.S. Department of Commerce, ESSA combines the former Weather Bureau, Coast and Geodetic Survey, and Central Radio Propagation Laboratories of the National Bureau of Standards. While not intended to be the sole official agency in the field of geophysics, ESSA does provide a single governmental organization whose interests, capabilities, and services encompass all of the scientific disciplines required for the study of the physical environment.

One of the key fields of physical and mathematical science which is central to ESSA's ability to understand, predict, and ultimately control the phenomena of the physical environment is geophysical fluid dynamics. The hurricane draws its energy from the release into earth's atmosphere of heat latent in condensing water vapor drawn from the sea below. The seismic sea-wave is an oceanographic phenomenon generated by earthquakes. The drought is caused by abnormalities in the planetary wind systems, characterized by the rate and manner in which the atmosphere is heated by the sun and the oceans. Thus all these catastrophies result from motions and instabilities of the gases and liquids in earth's fluid envelope, which reaches from the outermost limit of the atmosphere to the bottoms of the oceans. And even the earthquakes may occur because of the slow convective processes of the fluid core of the earth far beneath the seas.

To understand these phenomena and, hopefully, to lessen their ravages through adequate warning or control, we must deal with them as adjustments of the fluid envelope to the forces that set it in motion. Whether we are concerned with the tornado, the hurricane, the seismic sea-wave, the storm surge, the flood, or the severe winter blizzard, we are concerned with processes whereby energy either locally, regionally, or globally is being released or redistributed or transmitted from one place to another.

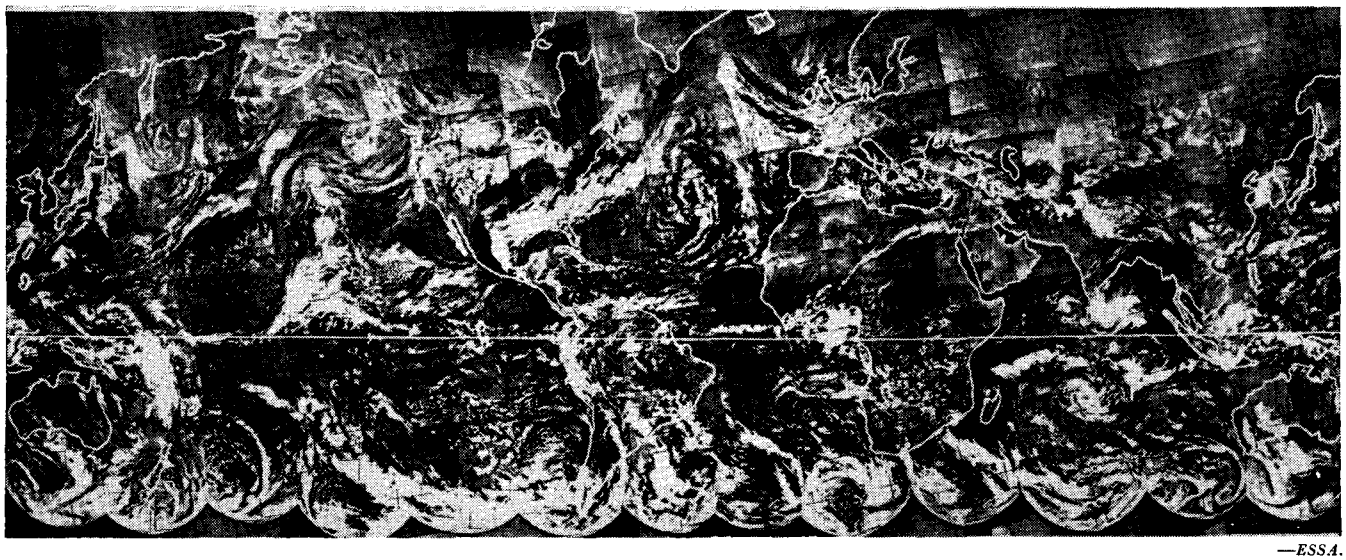
In grand outline, the earth's fluid envelope maintains the habitable range of temperature and moisture throughout the world. Without its energy redistribution properties, the polar areas would be lifeless in uninhabitable cold and the tropics lifeless in unimaginable heat. The sustenance of life is due not only to the fact that the envelope is in motion; the chemical composition of the fluid regulates the amount and types of energy received. The ozone of the upper atmosphere shields us from the deadly ultraviolet radiation of the sun. The electrified shells of the ionosphere protect the surface of the planet from bombardment by particle radiation from the sun and enable us to use the electrical properties of the ionosphere for telecommunication. The carbon dioxide blanketed in the atmosphere acts as a greenhouse glass to retain the sun's heat and so to insure adequate warmth at the earth's surface.

In regulating the manner in which the fluid envelope is heated and cooled, the chemical composition of the envelope determines the gross nature of the motions of the fluid. The motions in turn insure the homogenous distribution of the chemical composition of the fluid.

Scientists understand only dimly the global forces acting on this restless environment. They have labored under the handicap that the principal laboratory in which they have to work has been the earth's fluid envelope itself—uncontrolled, uncontrollable, and observable only imperfectly. Given these circumstances, it is indeed remarkable that man has learned so much.

Geophysicists now feel that the key to future research and technology is development of a capability for simulating the

Robert M. White is head of the Federal government's new Environmental Science Services Administration.



—ESSA.

Man got his first look at weather everywhere around the earth from the above montage, made by imposing weather satellite photographs on a standard geographical map of the globe. The satellite: Tiros IX. The date: February 13, 1965.

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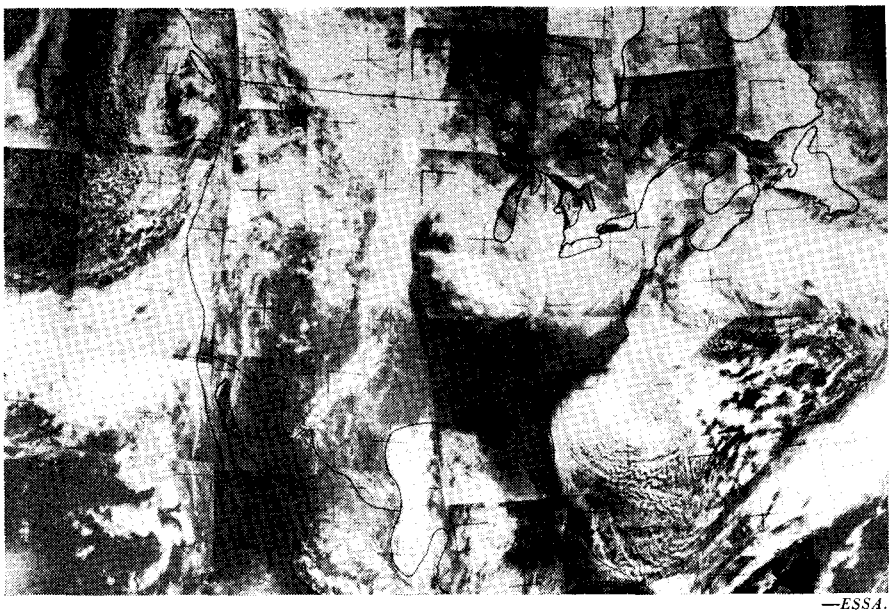
phenomena of the earth's fluid envelope. If we can simulate the tornado, the hurricane, the ocean currents, or the planetary wind systems and their fluctuations with fidelity, we will be in position to conduct experiments to determine how the phenomena respond to various applied forces. From the results of these experiments we will be able not only to predict and warn against natural catastrophies but to anticipate the consequences of man's own interference with his environment by calculating the environment's response to inadvertent and conscious changes in its composition.

To simulate is to build a model of a real process. The geophysicist, therefore, has taken to using the term "mathematical model" to connote the fact that he can, by means of properly formulated equations describing the physical processes and forces of the environment, construct a simulator for particular geophysical conditions. The mathematical model is less tangible than a model of glass and steel that might be constructed in a laboratory; but it is much more useful, for numerical solution of equations on the high-speed computer can not only portray the progress of storms but expose the nature of the currents within the oceans and the slow convective motions of the core of the earth.

EACH mathematical model represents a theory for the way in which the physical processes within the earth's fluid envelope interact and bring about changes in its future state. The adequacy of each theory can be tested by comparing real time changes of the true environment to the changes indicated by the mathematical models in advance. If the predicted changes occur in fact, the models can be said to possess fidelity in that they have portrayed the true course of events.

A measure of how far we have come in the past decade in the case of the atmosphere is demonstrated by the routine at the National Meteorological Center of the Environmental Science Services Administration at Suitland, Maryland. There mathematical models are daily computed to produce weather forecasts. These forecasts have demonstrated skills superior to those attained by other methods. Although not yet perfect (nor are our theories and our models) the numerical system of forecasting demonstrates what can be done.

The mathematical models are vital for other fundamental reasons. They finally provide a rational and meaningful framework within which we can see clearly the kinds of data we require of the geophysical system. The models also provide us with the only rational mechanism for judging consequences of man-made interference with natural processes. The scientific and popular literature abounds in speculation of possible catastrophic consequences of changing the chemical composition of the atmosphere and of artificially changing the physical characteristics of our environment. Today these speculations are impossible of any rational evaluation.



—ESSA.

The North American continent as seen from the weather satellite ESSA 1.

For example, scientists are concerned that the burning of fossil fuels is increasing carbon dioxide content of the atmosphere. Were the increase to continue, it might result in a warming of the atmosphere, which might result in a melting of the icecaps, which in turn might result in the inundation of coastal areas. Our theory of climate is so primitive that we do not know whether a warming of the atmosphere would result in the melting of the icecaps or another ice age. All arguments on this question are purely qualitative. The only way to a rational assessment is through a model of the atmosphere and the oceans which can tell us what the consequences would be of a rise in temperature or indeed whether an increase in the carbon dioxide content would raise the temperature.

IF the central problem of the environment is its consideration as a geophysical fluid system, then what must we do to unleash rapid progress towards simulating earth's fluid envelope? The governing laws of fluid motion tell us that we must be able to describe the initial conditions of the system, that we must know the input of energy and moisture at the boundaries of the fluid; they tell us that with these conditions satisfied, the future evolution of the fluid is calculable from the initial fields of the physical variables which describe the fluid and the exchanges of energy and moisture between the fluid and its boundary at the initial time. To make the calculations, we must be able to devise numerical schemes for representing the equations faithfully, and we must have the calculating mechanisms to enable us to make the millions upon millions of calculations required for a solution.

MANY of the problems of numerical calculation have now been solved. Our computer industry is advancing to the point where computers whose power is 100 times as great as the largest available today are now in the blueprint stage. There are many who therefore feel that the most difficult problem which remains to be overcome is that of the development of observational systems adequate to yield the necessary descriptive data of the natural phenomena. Here there is new hope.

The substantial advances of the prespace age in the development of instruments for observing the natural environment produced the radiosonde for sounding the atmosphere, the radar for remotely probing the atmosphere, the bathythermograph for sounding the oceans, radio probes to measure the ionosphere. In spite of these tremendous gains, we have only the crudest sampling of the environment—one totally inadequate to meet the requirements. Scientists estimate that 80 per cent of the earth's atmosphere is virtually unobserved. The atmosphere over the ocean and remote land areas is unsounded and unknown. The far reaches of the ocean are even less well known. We have but dabbled with the problem, and daily observations properly spaced and accurately measured over the oceans are almost unknown. Our watersheds are becoming increasingly better instrumented, but much remains to be done.

The age of extraterrestrial space exploration has provided us with an unparalleled opportunity. The earth-orbiting satellite is a unique new platform for

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observing the totality of the global environment. From such satellites we can sense the environment indirectly by interpreting absorbed and reflected radiative energy across the full electromagnetic spectrum; we can interrogate instrumental sensor systems floating in the atmosphere on balloons, in the oceans on buoys, at automatic stations in remote land areas.

OUR observational studies will require other and, in some ways, just as difficult efforts to provide information on the interactions between the various components of the earth-ocean-atmosphere system. To study the interactions between the atmosphere and the oceans, it will be necessary to mount extensive field expeditions, some of which are now in the planning stage. We must understand clearly the nature of the energy exchanges and the frictional coupling between the atmosphere and the oceans and between the atmosphere and the earth.

These new technologies finally open promising avenues for acquiring the necessary observations of man's environment. However, they are expensive technologies. To use them effectively, we must be properly organized. We now require global, cooperative efforts among the nations of a nature significantly different from international efforts that have gone before. It is the purpose of ESSA, working with other agencies of the United States government, the United Nations, and the International Council of Scientific Unions, to achieve a better understanding of the fluid dynamics that affect our planet.

It may be that the most far-reaching practical applications of space-age technology will be to enable man finally to observe what hitherto has been unobservable about his environment.

—*ESSA.*

Photomosaic of Europe, Africa, the Middle East.

—*Bulletin of the American Meteorological Society.*

Clouds produced by jet plane vapor trails over Colorado.

FOR ABOUT A WEEK at least, this month [of November 1965], I am convinced that there was, over a substantial part of the United States from the Rocky Mountains east, a persistent high cirrus cloud cover. And I am also convinced from watching the sky over Boulder, and from observations during a couple of trips I had to take to the East during this time, that a major fraction, perhaps all, of this cirrus cloud found its immediate origin in airplane jet vapor trails. I have a couple of quite striking photographs showing these as they appeared in Boulder. What degree of radiative influence did these cirrus clouds have on the thermal balance of the atmosphere? Were the temperature changes sufficient to have subsequent influences of major proportions on the weather? If the airplanes had not been flying through the region, would the cirrus clouds have formed anyway? These are questions to which we do not know the answers. But the cirrus blanket was probably a significant modifier of the heat sources and sinks of this period, and thus of the weather.

Perhaps, through this mechanism, we are already modifying the atmosphere, unknowingly and on a large scale, as we clearly are doing already on the city scale. Indeed, can we be sure that city-scale modification is simply city-scale? Or are the atmospheric solids and gases put in over the city bringing changes on a larger scale? The relative abundance of carbon dioxide is clearly rising in the atmosphere, almost certainly through man's intervention. But no one seems at all secure about what this is doing to the climate.

To turn to another question: Are man's inadvertent weather modification activities all detrimental, as they seem to be on the city scale? Have we possibly improved the available rainfall in some water-poor regions (or just the opposite)? Or have we done nothing? The scientific basis for authoritative answers is today small—distressingly small!

What does all this mean? To me it means, quite clearly, that the atmospheric sciences must, first and foremost, grow in the scale and, even more importantly, in the quality of work carried on. The problems that we are attacking are among the most challenging facing physical science. They make nuclear physics look easy.

We must recruit students who are the best and are trained to a sufficiently skilled level in mathematics and fundamental physics so that they can appreciate the full challenge of the underlying scientific problems.

We must experiment realistically, but safely, by means of computer-simulated global weather modification. And we must insist that experiments in nature be deferred until we can assure that their consequences are known and beneficial.

—WALTER ORR ROBERTS, Director,
National Center for Atmospheric Research,
Boulder, Colorado,
in the *Bulletin of the American Meteorological Society.*

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—*Pix.*

Waters of the Nile inundate homes in the Valley of the Kings behind Aswan dam.

THE FRAGILE BREATH OF LIFE: HOW TO KEEP IT GOING

BY SHARING KNOWLEDGE

By FREDERICK SEITZ

AS THE population of the world grows and expectations for a higher standard of living rise everywhere, mankind demands ever more of the earth. At some point in time, our species must learn to live in some form of equilibrium with our planet, either replacing that which we have taken from the earth or learning to satisfy our needs with plentiful rather than rare materials. While it is true that the ideal balance might be a relatively static one in which we would return to the earth exactly what we take from it—that is, the ideal balance of an unmanaged natural ecological system—we cannot expect mankind to achieve such balance in the foreseeable future. Rather we must expect more in the nature of dynamic equilibrium in which we do learn to preserve the production of the truly renewable resources of the planet, such as agricultural and forest lands, air and water, and, as we gradually exhaust the nonrenewable ones, such as the richer sources of materials and fossil fuels, acquire new knowledge which makes it possible to widen the source of such nonrenewable materials. In keeping with this pattern, we have developed techniques for using aluminum in place of copper for electrical purposes and for using uranium instead of fossil fuels as a source of power.

Unless we achieve some such balance, perhaps more dynamic than static, we shall eventually reach the state of a tethered animal which has exhausted the nourishment within the circle of its movement. Our present civilization would then collapse, and mankind would enter a very dark age.

The National Academy of Sciences has become deeply involved in this great ecological problem. Space available here allows only limited discussion of a few examples, so I shall choose a few on the domestic scene and as many on the international front without prejudice to the relative importance of many more others that must be omitted.

AS part of its responsibility to advise the Executive Branch and the Congress on scientific policies, the Academy has taken the initiative in casting light on the use of pesticides and in assessing the side effects resulting from such use. Such studies were initiated several years ago in connection with concern over the effects of pest control on wildlife resources. In 1965 a "flying symposium" was organized to bring together individuals who have quite diverse opinions on the question. Late in January of 1966, abount 600 persons were assembled in Washington to hear a panel of chemists, pathologists, entomologists, medical specialists, wildlife and conservation experts review practically every aspect of this thorny and complex issue.

Frederick Seitz is president of the National Academy of Sciences.

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A complete record of the proceedings will be published in the near future.

Another major domestic ecological situation to which the Academy has directed scientific interest is the number of important lakes and streams in the United States including Lake Erie, Lake Washington in Seattle, and Lake Tahoe in California, as well as many smaller resort and residential lakes scattered across the country that are undergoing major changes through the actions of man. In the most disturbing cases, nutrient levels of such lakes have been so increased that the total mass of organic matter is being enlarged explosively. In some instances the nutrients originate in sewage, in others industrial effluents, and in still others agricultural runoff. In any case, the rather delicate balance of the aquatic ecosystem is upset, one component of the biosystem thriving beyond all others and producing what are usually considered to be highly undesirable effects. Since the Europeans face the same family of concerns that we do in relation to lakes and streams in highly industrialized and heavily populated areas, the Academy is organizing an international conference, to be held in 1967.

A third facet of our domestic ecological crisis reflects the fact that our nation has lived so long with undeveloped frontier lands. As a result, we have failed to generate widespread public consciousness of the need for preserving our agricultural and natural resources. Since such conservation is now essential for our welfare, it is clear that we must undertake widespread public education, hoping to approach every segment of our population. In this connection, the Academy has established a commission on educational policy in agricultural and natural resources which hopes to encourage undergraduate colleges throughout our country to provide most students with information on the complexities, practical importance, and esthetic values of a natural environment.

PERHAPS the most ambitious national program the Academy now has under way is related to the International Biological Program or, as it is called for short, the IBP. Viewed internationally, the IBP is a responsibility of the International Council of Scientific Unions (ICSU), a federation of nongovernmental scientific organizations. The special committee of ICSU which deals with the IBP has recommended a focus on the biological basis of productivity and man's adaptation to his environment, with the scientists in each nation contributing as best they may with their talent and resources to studies of general worldwide interest. Participation in the IBP within our country by individual groups and laboratories will be voluntary. Moreover, only those programs which clearly would benefit through international cooperation will be included.

While most of the problems of national interest with which the Academy becomes involved are necessarily of a somewhat global nature, the office of our foreign secretary has recently come to deal with another lot of problems that are primarily of local interest abroad but also have obvious world-wide implications. Among this lot is the creation of man-made lakes in Africa.

THE economic and industrial development of the new African nations—particularly the building of hydroelectric dams for the generation of power, for the creation of fisheries, and for irrigation—is inevitably resulting in the transformation of the various ecosystems on which the biological equilibrium of the continent depends.

In recent years, bodies of water impounded behind the dams have begun to transform the African landscape—a change that will radically affect the nature of the river systems of Africa and prominently influence the continent's social and economic growth. Inundation of extensive areas inevitably will alter the ecology of the involved lake basins and contiguous hinterlands. As a result, the creation of these lakes (the Volta in Ghana; Aswan in Egypt, Kariba, shared by Zambia and Rhodesia; and the new lake to be formed on the Niger River at Kainji in Nigeria) offers an exceptional opportunity for making longitudinal studies prior to, during, and following flooding. These studies must employ all the relevant social, natural, and physical sciences, including human and wildlife resettlement, agricultural and land-use patterns, the feeding and breeding habits of fish, fish parasites, the growth of aquatic weeds, the chemical and physical characteristics of the water body itself, meteorological changes effected by the creation of large bodies of water, human and animal health problems, etc.

In view of its desire to increase African participation in the World Hydrological Decade and the International Biological Program, the Africa Science Board of the Academy has recommended that ICSU establish an appropriate mechanism to survey the pertinent literature, consult working scientists, and devise a plan for stimulating research on man-made lakes in Africa. ICSU has accepted the proposal and expressed willingness to cooperate with the United Nations Development Program in supporting scientific research projects on the man-made lakes.

Through its Africa Science Board, the Academy has been asked to organize a subcommittee on man-made lakes to advise the United Nations Development Program and its executing agency, the Food and Agriculture Organization of the United Nations, concerning establishment and initial operation of a lake research center on Kainji Lake in Nigeria. The purpose of the project, which will last six years, is to carry out the investigations in selected fields necessary to ensure comprehensive development of the lake's resources. Participation by other research organizations in Nigeria will be encouraged, and, in order to avoid duplication of work being carried out by existing agencies, the project will concentrate on research in the fields of limnology and fisheries, sociology and economics of resettlement, public health and diseases, conservation, and tourism.

Socio-economic surveys in connection with the resettlement of the 50,000 people to be displaced by Lake Kainji will be conducted in three stages: before inundation, immediately after inundation, and when the lake's new regime is settling down. Studies of malaria, schistosomiasis, onchocherciasis, and perhaps trypanosomiasis, as well as public health problems arising from dam construction and resettlement, may also be undertaken. Preliminary surveys of the Kainji dam site have already been completed by a United Kingdom task force of sixteen biologists from the University of Liverpool and (through the support of the Ford Foundation) an anthropologist, Dr. Thayer Scudder of the California Institute of Technology.

In the American tropics, the Academy's Latin American Science Board has completed a two-year study of ways and means to improve tropical agriculture and has recommended establishment of agricultural research-training institutions in three principal ecological zones of South America: the hot-humid lowlands, the arid zone, and the Andean highlands.

The eighteen nations comprising the American tropics enjoy three agricultural advantages: namely, the most incoming solar energy, the highest photosynthetic potential, and the longest growing season of any part of the Western Hemisphere. Paradoxically, the tropics suffer chronic agricultural shortages—due, in part, to the farmer's lack of economic motivation and resistance to change. Crops are produced at a low level of husbandry, which may range from the most primitive and simple collection of a wild product to a sophisticated culture of superior crop strains. Basic food crops are often produced from primitive, almost unselected plant varieties which are able to survive adverse conditions and give a meager yield despite local pests, diseases, and nutrient-deficient soils.

Research may discover entirely new crops of value both to the tropics and

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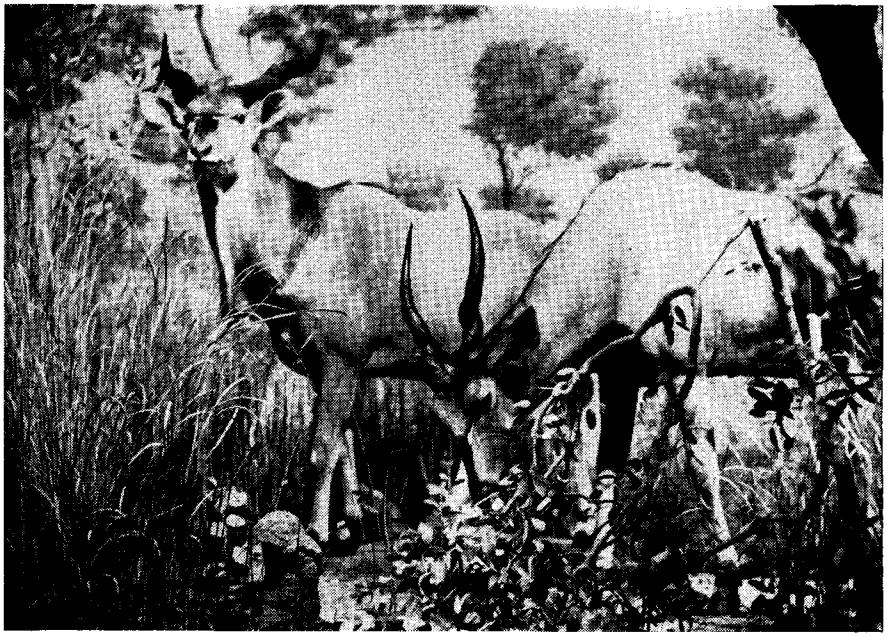
the temperate zones. Several thousand unknown or little known wild plant species in the Amazon basin challenge the taxonomist, the economic biologist, and the chemist with perhaps their greatest frontier for research on new crops for industrial, medical, pesticidal, food, and other uses. Much of the land in both the Andean highlands and in the dry tropics is apparently unsuitable for crop production because of extremely shallow rocky soils, or, in high altitudes, by temperatures so low that cropping is precluded. Native grasses in the highlands, which are high in silicates, form a spare unproductive cover. Range research, coupled with soil fertility studies, could contribute much toward the development of this land. There is great potential for eventually building up a cattle industry comparable to that in the United States through cross-breeding to produce improved breeds and through pasture and range management improvement. However, this will require research in all related areas such as pastures, fertilization, water control, control of diseases, and development of processing and marketing systems.

Research in soil and soil management is fundamental to the agricultural programs of all three ecological regions. The wide range of soils, from almost bare rock to soils with twenty feet of topsoil in the Cauca Valley of Colombia, from saline to extremely acid soils of the Amazon basin, from very steep slopes to swampy level lands indicates the complexity of the problem.

It is recognized that the Amazon basin today holds the largest continuous tropical forest region in the world and that its biology is the least known of any major portion of the world's tropics. Obviously, in the face of world economic, population, and social pressures, it is essential to collate known biological information, to make a thorough inventory of the natural resources of the Amazon basin, and to relate this primary information to problems of the social, economic, research, and educational needs of the several Amazonian countries.

In summary, the National Academy of Sciences is setting out, in many different ways, to play a larger and more vigorous role in the ecology of ecology. For as we must develop new techniques for gaining a deeper understanding of the biological and social relationships of the living community and its terrestrial environment, so must we develop new methods for putting such knowledge to immediate and practical use. To neglect this responsibility would not only serve to prolong the misery of a large part of the earth's population but also hasten the day when their privation would be shared by their more affluent—and profligate—neighbors.



—*American Museum of Natural History.*

The eland: first wild animal to be domesticated in 7,000 years?

MAN'S DOMESTIC plants and animals have been greatly improved by modern genetics and husbandry. But these species were domesticated thousands of years ago. Today the International Biological Program's section on use and management of biological resources is hunting for wild species that may be domesticated or wild relatives of domestic species that may add desirable genetic material to our plants and perhaps even to our animals. By domesticating some of the wild ruminants, it may be possible to use our plant resources better through more efficient grazing animals than those presently domesticated such as the cow, sheep, goat, water buffalo, and reindeer.

Conservationists and animal husbandmen of Africa have long speculated that perhaps the eland was more efficient in using the coarse pastures of tropical Africa than are cattle. The eland is one of the antelope family, but commonly reaches a size of 1,000 pounds and more. Scientists have been attracted by the ability of this species to keep fat and sleek on pastures where cattle are thin, wasted, and dying.

If the eland can use the coarse grasses better than cattle, they ask, why not domesticate and use the eland instead of cattle in those areas where it does so well?

Experiments are being tried. The results are encouraging. The eland tames well, and, if through selection, herds of elands can be handled and herded as cattle, then a new species may well be added to man's list of domestic animals.

Breeding for favorable characteristics would be a next step, and harvesting surplus animals for human meat would be an end product.

So much needs to be done in so short a period. In the past, man could take thousands of years to develop his breeds of animals, and he did. Today we hope to accomplish the same goals through modern scientific methods in a human generation. The human population pressure may not give us even that much time.

While the eland seems to be the most promising species, scientists on every continent are studying other species of wild herbivores to discover the secret of their existence in areas not now considered adequate for man and his animals. If some of these species well adapted to land areas which are unfertile, dry, and with unfavorable climate can be domesticated and still use feed resources that humans cannot eat, then the total food supply may be increased. Most important, it will be a protein resource that is increased. Protein is far more limiting than total calories in our battle against malnutrition and starvation.

The need for IBP studies is underscored by the constant pressure on marginal lands. If we cannot study and perhaps domesticate presently wild species, they soon may have no place remaining and man, making much poorer and less efficient use of the land, will have made his own food even harder to secure.

The challenge is one of the most exciting to face biological scientists in many generations.

—GEORGE K. DAVIS.

(George K. Davis is director, division of biological sciences, University of Florida, and convener of the use and management section, International Biological Program.)

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BY USING NATURE AS A LAB

By BARRY COMMONER

THE FUNDAMENTAL properties of the biosphere impose important conditions on any scientific effort to understand them. The basic problems are *given* and cannot readily be simplified to facilitate experimentation and analysis. It may be possible to isolate specific parts of a complex system for experimental purposes and to simulate certain of its interactions in mathematical or experimental models. However, the very factors which are ignored in artificial simplification of the problem may be decisive. In all cases proposed solutions must be tested in the arena of the natural system itself.

The biosphere is inherently complex, and its complexity is the key to its uniqueness. In part, environmental complexity is due to the diversity of organisms and physical conditions encountered. The properties of a waterway or of a sewage-disposal system derive from the activities of dozens of genera of bacteria, fungi, protozoa, and algae, and of higher plants and animals. Each of these interacts with various features of its physical and biological environment. An effective study of the biosphere must therefore be founded on a wide range of sciences: botany, zoology, microbiology, biochemistry, physical chemistry, physics, geology, meteorology, the behavioral sciences, the computer sciences and engineering.

Another reason for the intrinsic complexity of the biosphere is that the interactions among its living and nonliving constituents are characteristically nonlinear and subject to complex feedback relationships. Natural biological systems are therefore governed by relatively narrow ranges of stability, by sensitivity to weak perturbations, and by a tendency toward marked cyclical changes in time. This feature imposes additional demands on scientific analyses of the biosphere. The development of cybernetics and its practical expression in modern computers has been of great value in the analysis of nonlinear systems. However, conceptual approaches and mathematical techniques relevant to such systems are still poorly developed and need to be improved considerably.

The biological sciences, as research and training enterprises, must change to meet the new responsibilities of environmental biology. Experimental knowledge of the wide range of organisms involved in environmental problems is surprisingly limited. For example, among 700 physiological studies reported in 1960, 92 per cent were based on only seven genera: man, monkey, dog, cat, rat, mouse, rabbit, frog. Most detailed biochemical and physiological studies of plants are based on a few popular genera: bean, tobacco and corn, and the alga *Chlorella*. The great preponderance of current biochemical studies on microorganisms involve only a few genera, among which *Escherichia coli* heavily predominates. Such limitations of the experimental base of biology may lead to misleading generalizations. As a recent review of the endocrinology of pregnancy notes:

> . . . the restriction of laboratory work to a handful of small rodents can limit ideas and cramp outlook. Much more detailed knowledge on a far wider zoological basis will be required before firm general principles of the special reproductive endocrinology will emerge. . . .

Much of current biological research has a limited usefulness in environmental studies because it neglects the intrinsic complexity of biological systems. There is, at present, a heavy emphasis on artificially simplified biological systems. A great deal has been learned about extracted enzymes, the effect of a pathogen on a laboratory animal under controlled conditions, or the reaction between individual organisms and environmental factors in a separate, pure culture. What is much more difficult—and less often attempted—is to understand the *new* consequences that arise when an array of enzymes interact in the same cell, when a variety of organisms are present together in a sewage treatment plant, or when the environment of a city affects the prevalence or nature of a disease.

The end result is the accumulation, at an unprecedented rate, of a vast array of analytical data, especially on the molecular level, from various simplified experimental systems artificially derived from living organisms. But, at the same time, the derivation of concepts more applicable to the complex, natural system itself has been neglected. The rapidly growing body of analytical data generated by modern experimental biology remains to a large degree unrelated to the problems of the environmental biology, which are perforce concerned with the complexity of natural systems.

In the past, physics and chemistry usually were concerned with systems far less complex than those of interest in biology, and it is often held that these sciences can be brought to bear on biology only when biological processes are reduced to the molecular level. Because this process of reduction is impossible in the environmental sciences, they tend to become isolated from physics and chemistry. However, as a result of recent developments in solid-state physics, cybernetics and computer technology, there are growing possibilities for interactions between biology and the physicochemical sciences which are not constrained by artificial reduction of biological problems to molecular ones. Recent developments in solid-state physics and in the theory of the structure of matter have generated important concepts about the properties of inherently complex systems —for example, superfluids and superconductors—which are directly relevant to the problems of interest in environmental biology, and in biology generally.

These considerations define the precepts which have guided the establishment of the Center for the Biology of Natural Systems at Washington University. The center recognizes the importance of learning how to deal with intrinsic biological complexity on whatever level it occurs: the biosphere, specific ecosystems, populations, intact organisms, and cells. The center is designed to explore the integrative process which we believe to be essential to the future of the environmental sciences and to biology as a whole. It will emphasize efforts to integrate data derived from simplified experimental systems into concepts which relate them meaningfully to inherently complex natural systems. The center will, we hope, forge important links between the environmental health sciences, basic biological theory, and modern physics and chemistry.

THE philosophy of the center therefore demands proficiency in a range of disciplines extending from engineering through ecology to biochemistry and modern physics. Ideally the environmental biologist ought to be a generalist, the counterpart of the specialist. How-

Barry Commoner is chairman, botany department, Washington University, St. Louis, and director of the Center for the Biology of Natural Systems—first grant recipient in a new U.S. Public Health Service program of support for environmental health research.

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ever, given the breadth of knowledge required, it is impossible to create such competence in a single individual. The center's approach is designed to meet this dilemma by forming a synthetic generalist out of an aggregate of specialists. The center faculty (seventeen senior fellows) comprise a group of specialists in a wide range of basic and applied science: environmental biology and engineering, botany, chemistry, computer mathematics, medicine, physics, physiology, psychology, and zoology. All have in common a concern with the problems of environmental biology and a capacity for literate interaction. The senior fellows, as a collaborative group, hope to develop new approaches toward fundamental research on natural biological systems.

The center's operational structure reflects this basic approach. It is a collaborative activity among three major institutions in St. Louis that are concerned with natural biological systems: Washington University (including the School of Medicine), the Missouri Botanical Garden, and the St. Louis Zoo.

This same collaborative approach also guides the center's training program. It offers fellowships to graduate students who wish to specialize in environmental biology and engineering, and also to students specializing in a wide range of disciplines. The first group of graduate fellows appointed to the center includes students working toward advanced degrees in mathematics, physics, chemical engineering, botany, zoology, physiology, and psychology. Graduate fellows are not asked to divert their interests from their chosen field, but only to add to these interests a sensitivity to the problems of environmental biology and health and a willingness to learn how to couple their own skills, in collaboration with other specialists, to the analysis of these problems.

A unique feature of the center's graduate training program is the interdisciplinary tutorial. This consists of groups of three to five students, drawn from different disciplines, working together under the guidance of a senior fellow of the center on a topic related to natural biological systems. This activity is expected to provide direct experience in the type of interdisciplinary collaboration essential to the center's approach.

The center also offers postdoctoral fellowships designed to give specialists in the basic sciences and in the environmental health sciences experience in the distinctive type of interdisciplinary activity that characterizes the center's program. A special effort is being made to include in the postdoctoral program specialists in the environmental health sciences, such as sanitary engineers and specialists in environmental pollution and bioclimatology. Such individuals will provide an important link between the center's program and the applied fields of environmental health and, at the same time, add to these specialists' competence a new capability in interdisciplinary approaches to their fields.

The center's research program is designed to encourage new approaches and exploratory investigations. Ten research projects have already been initiated. At one end of the spectrum of activities is an investigation of the tendency of certain special types of organic free-radicals that may occur in living cells to absorb energy in the extreme infrared region of the spectrum—a region usually neglected in considering environmental effects on living things. At the cellular level is an investigation of the control mechanisms which mediate the effects of the environment on the inherent complexity of the cell. The interactions between organisms are being studied in a variety of ways, one being an examination of the changes in form and sexuality in algae which result from their interactions with other organisms: processes that may be operative in the mixed populations of water supplies and sewer systems. Microscopic plants in a lake also affect each other profoundly through the organic material they release to their surroundings. One center project is developing new techniques for studying the organic substances that regulate growth of algae in lakes.

Several center projects are concerned with relationships between organisms and their physical environment. One project will examine evolutionary adaptation for an answer to the question: What factors determine a successful match of an organism to its environment? Another project will investigate the possible effects of environmental changes on the chromosome structure of certain plants. Still another project will seek to establish the factors that govern exchange of energy between plants and the environment.

At the Missouri Botanical Garden, the extensive herbarium will be used in a study designed to evaluate the impact of human activities on the biological environment. At the St. Louis Zoo, basic data will be obtained on the wide variety of animal species that must be dealt with in natural biological systems. A center-supported study at the Washington University Medical School is concerned with the biology of streptococcal infections in man in an effort to determine what pathological processes are initiated by complex host-parasite interactions. In conjunction with a number of these projects, we are developing new computer-based analyses of complex biological systems in order to investigate the theoretical synthesis of complex biological systems and the experimental verification of such models by quantitative methods.

IN all this work there is extensive collaboration and exchange of ideas: among botanists, zoologists, and computer specialists; among specialists in solid-state physics and specialists in the chemistry of the cell; among experts on algae and environmental engineers. The center's research program, like its program for graduate and postdoctoral training, makes a strong effort to carry out its basic philosophy—that the new and pervasive problems of environmental biology demand a new approach based on the full participation of the total array of modern science. The center is an experiment, a test of the hypothesis that we can learn how to adapt our science to the urgent need for understanding of the natural biology of the environment and so help to preserve the community of life from extinction at the hand of man.

"Hey, Sam, the big round yellow thing came up again."

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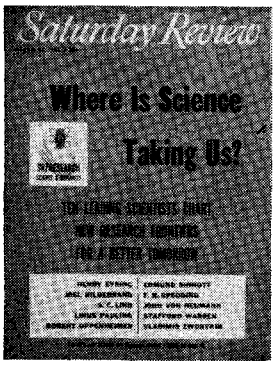
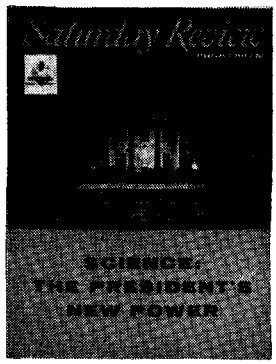
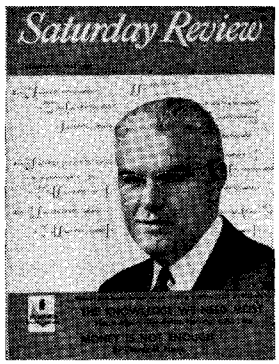






THE FRAGILE BREATH OF LIFE: HOW TO KEEP IT GOING

JUST BY WRITING A LETTER

ACCORDING to a tradition that long antedated the Science and Humanity Supplement, *Saturday Review* belongs to its readers. I dismissed this circumstance as a journalistic cliché until I joined the *SR* staff in 1956 and was confronted by the genuineness of it. In the subsequent decade, some of the most rewarding assignments I have undertaken have been undertaken because of people who wrote to me hesitantly about personal worries the public importance of which they weren't sure.

I know no purer working of the democratic process. As long as a citizen can trust an editor enough to believe that the journal the editor works for has the courage to discuss unpopular causes, the concept of self-government is safe.

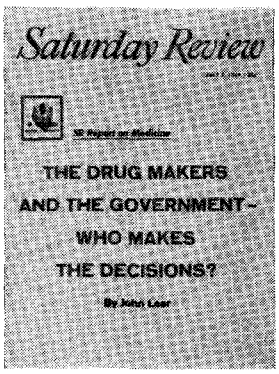
Now the study of man as a whole being, responding to the whole of his environment—which includes the responses of other men to him and his to them, as well as to the natural forces that move them all—may not deserve classification as an unpopular pursuit. But it is certainly not a popular one. Too many profitable enterprises fear the panoramic approach dictated by commonality. Perhaps what is needed most just now is a kind of down-to-earth inventiveness capable of discovering profit in the recovery of wastes and the recapture of air and water pollutants.

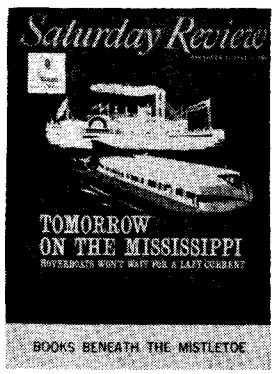
Let it be clear, in any case, that letters from readers of the Science and Humanity Supplement will be as welcome during the next ten years as they have been during the last ten. And let it be hoped that the public consequences of the communications to come will be as gratifying as the effect of past correspondence has been after its translation into editorial policy. For the record can be reviewed with some pride.

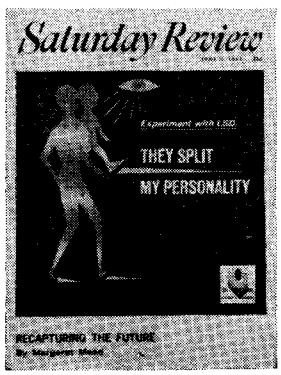
The very first experimental issue of the Science and Humanity Supplement appeared on March 26, 1956. Two major instances of the impact of science on society were scrutinized. One was the role of science in building the Union of Soviet Socialist Republics into a great political power. The other was the overselling of the Salk vaccine against polio, which even then was considered by conservative medical men to be less promising than the not yet accepted Sabin oral vaccine.

Lacking the gift of prophecy, *SR*'s science editor could not foresee Soviet dominance of interplanetary space exploration. But these columns did report Russian spaceship designs and so prepared *SR* readers for the shock of the launching of Sputnik I.

Again making no claim to extra-sensory perception, the June 1956 Supplement pointed out the need for scientific evaluation of American foreign policy. Thailand was taken as an instance of how to go about learning to befriend an alien people. Ten years later, the tragedy in neighboring Vietnam reminds how long and disastrously ignorance can fester. For social scientists were long ago persuaded that the course of events in Vietnam could have been significantly altered through intelligent use of behavioral studies by the State Department. It is especially curious that in that Supplement of June 1956, Carnegie Corporation's psychologist-president John W. Gardner should have been quoted at length on the crucial quality of perceptive listening. Today Dr. Gardner's advice as President Lyndon B. Johnson's cabinet secretary of Health, Education, and Welfare may be decisive in discovering a workable solution to the Vietnam crisis. Differences in behavior







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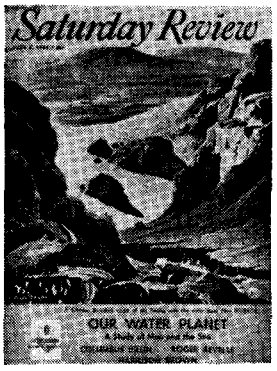
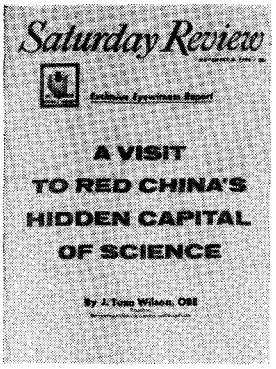
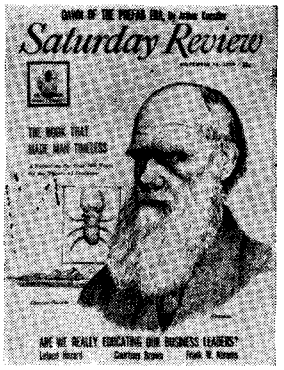
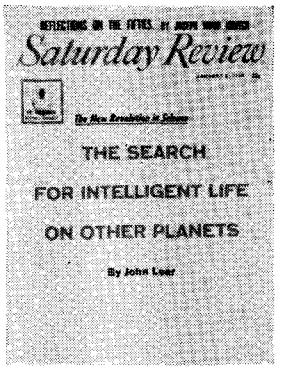








native to the Orient and the Occident for centuries will be taken into account inevitably.

Since *SR* is fundamentally a magazine of ideas, the Supplement from its beginning paid relatively small heed to the gadgetry that meant science to most other magazines. However, when technology took giant steps impinging on the world of ideas, those steps were noticed. For example, one of the first year's science covers pictured Dr. Vladimir K. Zworykin, of the Radio Corporation of America, in recognition of his pioneer work in medical electronics, particularly his teaming of TV with the electron microscope to study living cells in motion. That same issue carried a report on a famous accident at the Corning Glass laboratories and its historic consequence: discovery of a ceramic-like glass with exceptional resistance to intense heat.

In February 1957, an entire Science and Humanity Supplement was given over to consideration of science as a new power of the Presidency of the United States. On that occasion, the National Science Foundation was singled out for special attention, and the suggestion was made that NSF should set priorities for scientific spending. The reaction was sharp. *SR*'s science editor was criticized for dabbling in matters beyond his competence. Only now, a decade later, are committees of Congress echoing the early *SR* proposal for a tough set of NSF priorities.

The need for greater encouragement of the behavioral sciences, as distinct from the older disciplines of physical and biological research, was emphasized in the Science and Humanity Supplement for February 1958. The continuing impact of that issue of *SR* finally brought about establishment of full-scale social science divisions within the National Academy of Sciences and the NSF.

Since the deep hurt to American pride inflicted by Russian successes in extraterrestrial space exploration had led the Federal government in Washington to disproportionate spending on an American moon landing before a Russian could reach the moon, someone had the responsibility of pointing out that earth's oceans were more immediately important to human welfare than were any number of lunar excursions. Since no one else was exercising the responsibility, *SR* did so in a special issue titled "Our Water Planet."

PREOCCUPATION with the Soviet threat to American prestige in science had another serious side-effect: Communist China now was looked upon as a land of ignorant barbarians, as Russia had been before the Sputniks. This ludicrously wrong impression had to be corrected, and an unexpected opportunity opened with the return of Canadian geophysicist J. Tuzo Wilson from a tour of scientific institutions on the China mainland. Wilson's report was published exclusively in *SR*'s Science and Humanity Supplement. It generated a new atmosphere, which allowed the American Association for the Advancement of Science to sponsor a national symposium on the Chinese question. Since then discussion has broadened until many people are talking candidly of admitting Red China to the United Nations.

OTHER examples of a cascade effect from *SR*'s pages to the marketplace of popular opinion can be traced by any library visitor who thumbs back through the ten years of *SR*'s special concern with science.

There has been a growing awareness of ecology since the Supplement that celebrated the 100th anniversary of the Darwin-Wallace theory of evolution.

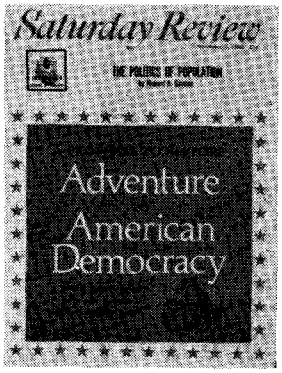
SR's issue on "the search for intelligent life on other planets" was the first of a long list of magazine and book accounts of this fascinating exploration.

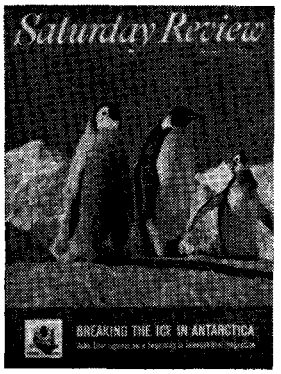
SR's disclosure of abuses in administration of drugs led to reform of the drug laws after several years of agitation.

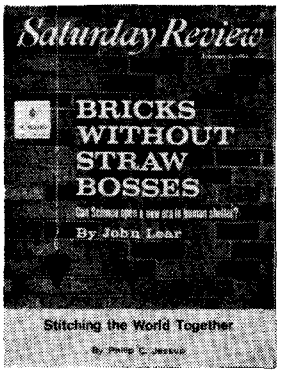
SR's report on postgraduate research education in the Southwest has since become a model for similar experiments elsewhere in the country.

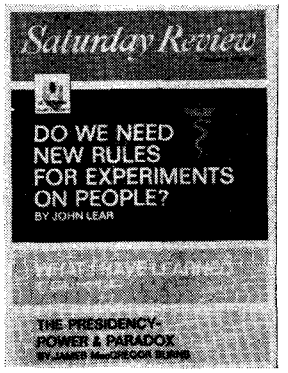
SR's discussion of the principles of air-cushion vehicles has advanced the development of that giant stride in the technology of transportation.

SR's exposure of the perils of LSD and other "mind-expanding" drugs pre-









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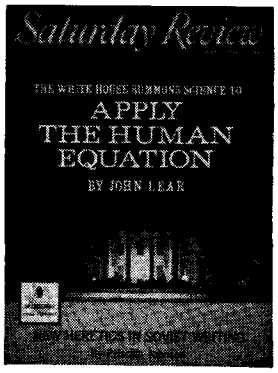
ceded confirmations by other magazines by three years.

Some scientists have resented the insistence with which these pages have pursued the social implications of science. These people say science news should be nothing more than a recording of scientific experiments across the board. But most of *SR*'s readers have agreed with the philosophy that science *per se* belongs in the technical journals and *SR*'s job is to remain alert to what science does to the human organism. A steady tone of warm acceptance has characterized letters written in reaction to critical questioning of H-bomb explosions affecting earth's magnetosphere, of the Federal Aviation Agency's imposition of sonic boom experiments on the residents of Oklahoma City, of irresponsible handling of research funds solicited by private health agencies from voluntary donors, of failure to protect minority groups of physically disabled persons from danger of poisoning by fluoridated drinking water.

The most sweeping studies ever made by the National Academy of Sciences—one covering the interlocking problems of transportation and urbanization, and another surveying natural resources, animate and inanimate—were noticed at length only in *SR*'s columns. The impact of these, unfortunately, has been harder to judge from the number and content of letters coming into *SR*'s science desk. Therefore, it seems worth laboring the point that present-day need for application of the science of ecology is so great as to near desperation. The fragile breath of life can be extinguished not only in the ways elucidated in these pages—through imbalance in the supply of oxygen, carbon dioxide, or nitrogen—but through rupture of the phosphorus and sulfur cycles, which help replenish the chemical called adenosine tri-phosphate (ATP), the apparent spark of life. To tell the whole truth, not even the wisest scientists can identify all the possible routes to disaster. Present-day knowledge just isn't adequate. If *SR* readers fail to express their understanding of the crisis today, tomorrow may be too late. —J.L.



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—*Manny Warman.*

The Advisory Board on the Pulitzer Prizes sits for a rare portrait. (For names, see box.)

FIFTY YEARS OF PULITZER PRIZES

By JOHN HOHENBERG

FOR FIFTY YEARS it has been an amiable custom at Columbia University to award the Pulitzer Prizes each spring without conscious planning of fanfare or ceremony. Most of the time the awards have been made public in a bare and somewhat battered classroom at the Graduate School of Journalism. In the last two years, primarily because of the growth of the school, it has been necessary to shift to the more formal World Room, where proceedings are conducted under the stern gaze of the busts of Joseph Pulitzer, the donor, and Herbert Bayard Swope, winner of the first prize for reporting.

But whether the announcement is made in a classroom or the World Room, the consequence is the same. A score or more reporters, most of them waiting at open telephone lines, begin dictating the results. Within a minute, bulletins and leads tumble off the wires in thousands of newsrooms in this country and abroad. President Grayson Kirk of Columbia dispatches telegrams of formal notification and congratulation to the winners of the fifteen highest awards for merit in literature, drama, music, and journalism in the United States. At the end of the afternoon, the secretary of the Advisory Board on the Pulitzer Prizes then completes the ceremony of award by depositing the certificates and checks for each of the winners in the nearest mailbox.

Changes were made for this year's fiftieth anniversary dinner at the Plaza Hotel in New York on May 10 but they are not a permanent departure from this unspectacular routine. The celebration honors all past and present winners of Pulitzer Prizes and acknowledges the university's indebtedness to its trustees, members of the Advisory Board on the Pulitzer Prizes, and the many distinguished jurors who have made the awards possible. Such a gesture once in fifty years is not extravagant and it is intended to set no precedents. In any event, it is no more likely to become an annual affair than were the occasional smaller dinners on Morningside Heights that were abandoned more than two decades ago.

Such restraint is in the Pulitzer tradition at Columbia. When announcement of the prize winners has met with popular favor, there have been silent thanks from Morningside Heights. When it has aroused controversy, Columbia has generally refrained – sometimes with great effort—from making any reply,even if the

Pulitzer Advisory Board: In the photo above are (L. to R., rear row) Newbold Noyes Jr., editor, Washington *Evening Star*; Ralph McGill, publisher, Atlanta *Constitution*; Paul Miller, president, the Gannett Newspapers, Rochester, New York; Turner Catledge, executive editor, the *New York Times*; John Hohenberg, secretary, and professor at the Columbia Graduate School of Journalism; Erwin D. Canham, editor-in-chief, *Christian Science Monitor*; W. D. Maxwell, editor, Chicago *Tribune*; Kenneth MacDonald, editor, the Des Moines *Register* & *Tribune*. (Front Row) Barry Bingham, editor and publisher, the Louisville *Courier-Journal* and Louisville *Times*; Louis B. Seltzer, editor of the Cleveland *Press* until early 1966; Joseph Pulitzer, Jr., editor and publisher, St. Louis *Post-Dispatch*, and grandson of the donor of the prizes; Grayson Kirk, president of Columbia University; Norman Chandler, chairman of the board and president, the Times-Mirror Company, publisher of the Los Angeles *Times*. Only Sevellon Brown, associate editor, the Providence (Rhode Island) *Journal* and *Evening Bulletin*, was not present for this picture, taken at the Columbia Graduate School of Journalism in 1964.

John Hohenberg has been secretary of the Advisory Board on the Pulitzer Prizes since the 1954-55 season. The views expressed here are his own and not necessarily those of either the board or Columbia University.

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criticism has been both unjust and untrue. An outstanding example was President Nicholas Murray Butler's reaction to Sinclair Lewis's wrathful rejection of a Pulitzer Prize for *Arrowsmith* in 1926. Dr. Butler ruled merely that the award would stand.

The position, in short, has been that a great university, once it is accorded such a public trust, should do everything it can to see that the awards are fairly and honestly made. It is, however, no part of the university's mission to defend or discuss the work of its juries, the position of the advisory board or the voting of the university trustees. There may, of course, be exceptions in the future; but generally, such restraint constitutes the basic policy of the university, even though it does not and, in fact, cannot bind individual jurors or advisory board members.

Without doing violence to a tradition which I respect, I believe that certain truths, most of them self-evident, are bound to emerge from any broad consideration of the public record of the Pulitzer Prizes these past fifty years.

THE most obvious is that they have been granted sparingly. The pressure for proliferation and expansion has been great, but it has been resisted. In letters, drama, and music, in the first forty-nine years, there have been 258 prizes for 234 persons, the difference being accounted for by multiple winners and co-winners of a single prize. For the same period, in journalism (the four reporting prizes and one each for editorial writing, cartooning, photography, and public service) there have been 289 prizes for 246 persons, forty-nine newspapers and one group, the war correspondents of World War II. Again the difference is accounted for by multiple winners and co-winners of a single prize. Special citations, now seldom given, have totaled only fifteen and have gone to twelve individuals and eight newspapers or other organizations.

As an average over a half-century, therefore, about ten Pulitzer Prizes a year have been granted. Primarily this is because there were fewer awards in the beginning than there are now; but another important factor has been the refusal to grant a Pulitzer Prize automatically each year in every category. On forty-eight occasions in the first forty-nine years the university has announced no awards in various categories.

It is a curious coincidence that the two prizes most carefully watched by critics and the public, those for fiction and drama, have been withheld more often than any others (fiction seven times and drama eight). Music has been passed three times and biography, history, and poetry once each. In journalism there have been seventeen omissions—five for editorial writing, four for cartooning and public service, and two each for general reporting and national reporting. On all but one occasion this was because either juries made no recommendation or the advisory board did not accept the jury reports. The lone exception was in 1962 when trustees of the university refused to accept an advisory board recommendation.

Another self-evident truth about the Pulitzer Prizes generally is overlooked: they have a basis in law, and are conducted under legal principles not easily changed. Although the first prizes were awarded in 1917, the inspiration for them must have come much earlier to Joseph Pulitzer, then the publisher of the St. Louis *Post-Dispatch* and the New York *World*, an ancestor of the new *World Journal and Tribune*. In August, 1902, he dictated a memo proposing to bequeath money for a school of journalism at Columbia and added: "Incidentally, I strongly wish the college to pay from the large income I am providing a sum of (blank) in annual prizes to particular journalists or writers for various accomplishments, achievements and forms of excellence. . . ."

When he filled in the blank, it was for $20,000, which is almost the total of the prizes and fellowships today although it is far from meeting their administrative expense. In his agreement with the Columbia trustees on April 10, 1903, Mr. Pulitzer incorporated his prize proposal in his plan for the school. Out of his $2,000,000 benefaction, he allotted the income from $500,000 for the "prizes or scholarships for the encouragement of public service, public morale, American literature and the advancement of education. . . ." But he also specified that the prizes should not be awarded until the school had been in operation for three years.

Thus was established the legal framework of the Pulitzer Prizes from 1917 to the present. The rules and procedures that govern the awards are based on Pulitzer's will of April 16, 1904, which in turn was derived from the 1903 agreement with the university, still a part of the university statutes. What he intended was quite clear. While he granted the university trustees the right to bestow the awards or refuse to bestow them, he gave the advisory board great authority by making an award contingent on their recommendation to the trustees. Moreover, it was specified in the plan of award that while the university has the authority to appoint juries in all categories, the board has the right to accept, change, or reject their findings.

There were thirteen members of the advisory board when it was founded; there are still thirteen—the President of Columbia and twelve distinguished editors and publishers who serve a maximum of three terms of four years each and choose their successors. The only addition to this group has been a member of the journalism faculty as secretary, an administrative post representative of the responsibility of the journalism school.

Despite the limitations on the juries, their distinction over the years has had a marked and sometimes decisive influence on the board's recommendations. The public has heard of the relatively few jury revolts, but not as much of the expert work that has been accepted with gratitude over the years by the board. Without such faithful jurors, who perform magnificent services for little or no reward ($250 for non-journalism jurors, nothing for journalism jurors), the Pulitzer system could not operate.

The juries, which from this year on will consist of three to five members each, are chosen for wide representation. Up to forty editors from all parts of the nation judge the journalism awards, totalling 600 to 700 entries. About two dozen critics, writers, dramatists, poets, composers and professors judge the other awards. Book nominations now approach 500 annually, two score plays are considered, and even more music. Prizes for books and journalism are awarded for the calendar year; for drama and music, the season is April 1 to March 31.

Tradition, in a sense, is mixed with the law in the framework of the judging process. By tradition, no member of any jury and no member of the board may sit in judgment on any exhibit in which there is any possibility that he may have a conflict of interest. This rule is rigidly and impartially enforced by the university and its administrators, although in fact there never has been a deliberate violation.

THE difference between journalism and non-journalism juries—that one is known and the other secret—has been determined by the board largely on the basis of preferences of jurors over five decades. Some non-journalism jurors have always been concerned over the possibility of pressure if their identities were known. But on one basic matter all jurors have been treated alike. Their reports have been kept secret unless they themselves chose to create a controversy. One device, used by comparatively few jurors over the years, has been to "resign" if they were displeased with the ultimate award or lack of an award. However, as one juror in recent years remarked in refusing to join his colleagues in a mass resignation, there was nothing to resign from because all terms are for one year only.

At least a part of the controversy over the Pulitzer Prizes has been due to another self-evident truth: the annual nature of the awards. Not every year produces in each category an outstanding

(*Continued on page* 103)

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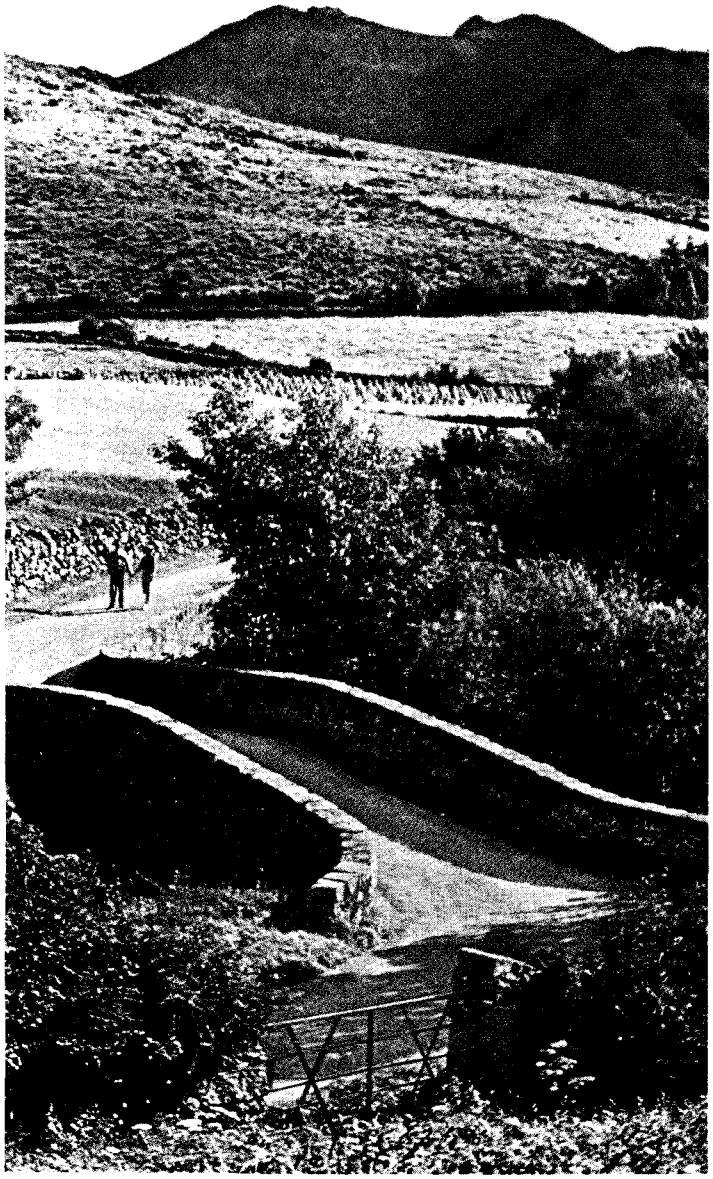

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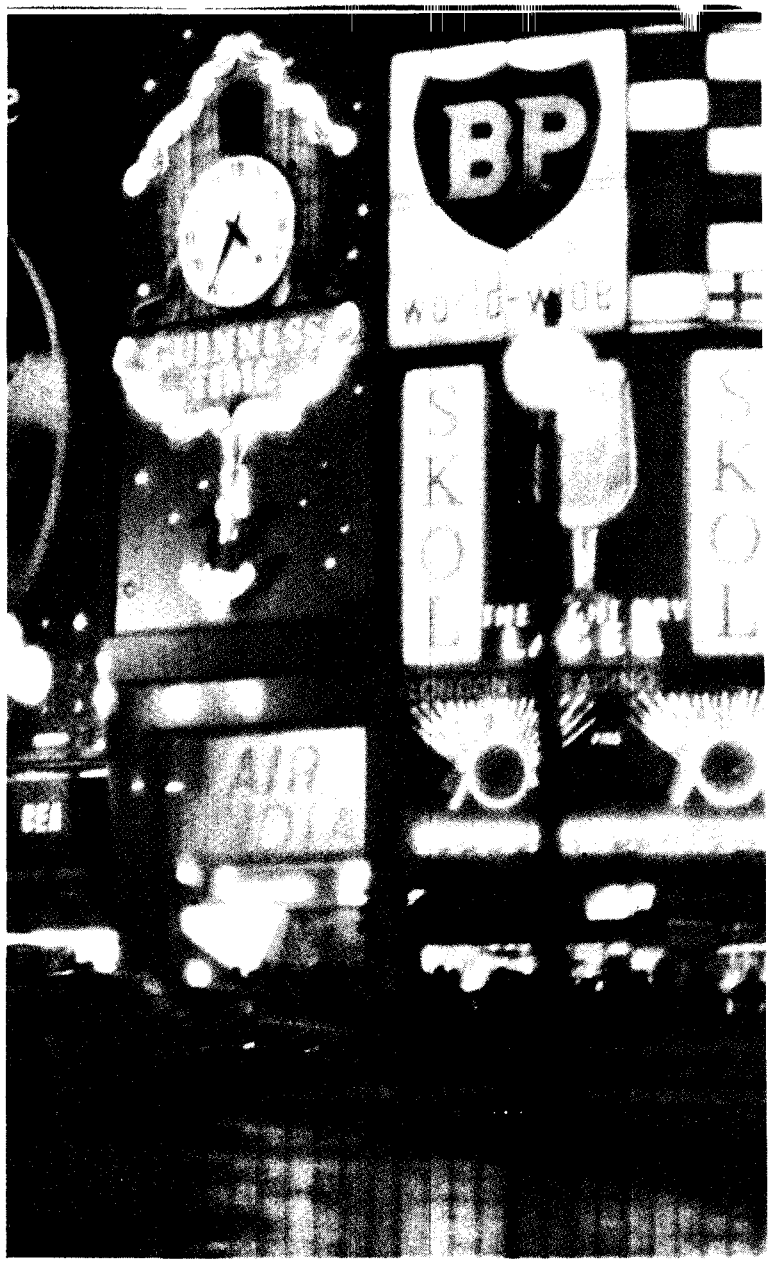

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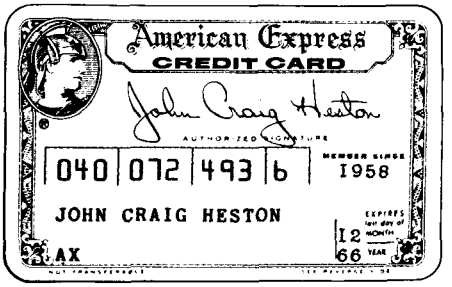

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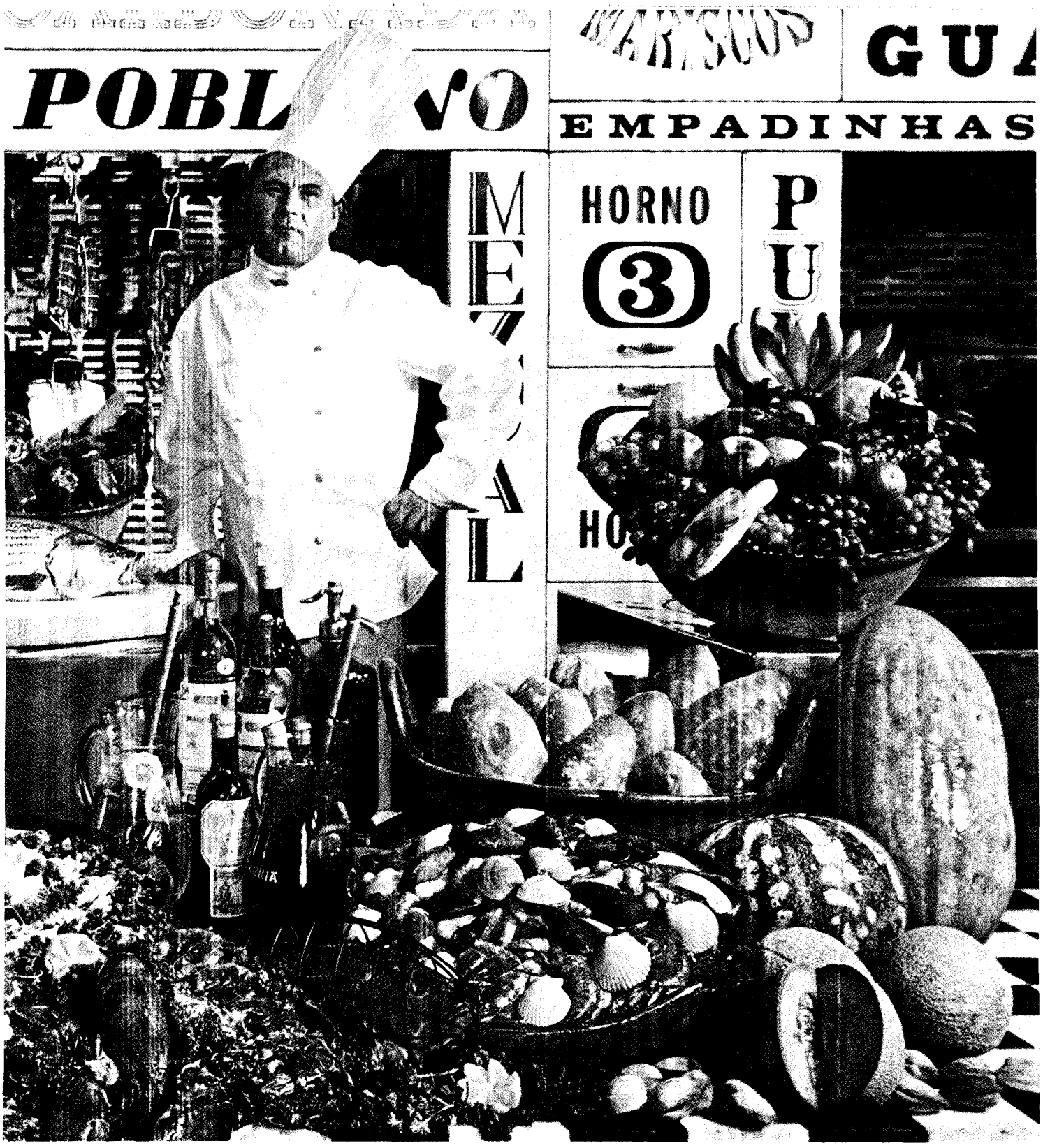

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Orange market, Tehrān, Iran.

Arabian Nights shopping center now open evenings

The ancient markets of Tehrān date from about the time of Harun al-Rashid, the Arabian Nights caliph, who was born nearby. Today oranges are sold by the light of a lamp filled with gasoline rather than a genie – a symbol of the growing interdependence of commerce that links cultures and continents. To the modern businessman, nothing is more vital than the flow of accurate, up-to-date information about the world around us. Rand McNally's contributions to this flow are significant. We publish marketing guides, banking references, globes, maps, atlases, and books. For other publishers of important information we print and bind all kinds of books, from catalogs to encyclopedias. Aladdin's whole treasure could not have been nearly so valuable.

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A Day in Khajuraho

WHEN I WAS FIRST in India early in 1959, and wholesale visits by sightseers from abroad were just beginning, I was urged very strenuously by the tourist director not to leave the country without visiting Khajuraho, famed village of the love temples. Unfortunately for Khajuraho, and for tourists, this old capital of the Chandellas, the medieval ruling dynasty of the midlands, lies deep in the heart of central India. It is, as a small guidebook published by the Director General of Archaeology in India explains, fifty-two miles south of Mahoba, twenty-nine miles east of Chhatarpur, and twenty-seven miles northwest of Panna.

If everyone has the position clearly marked on his Esso map, I need only add that the nearest railhead is sixty miles away, a distance covered by Indian provincial bus. In the winter months of 1959, planes operated on Sundays (if there was a full load), landing at Panna, twenty-seven miles away. Since there was only a small tourist bungalow nearby and since the irregularity of the air service meant a stay of at least one week and possibly more, most passengers chose to leave on the early plane, if indeed it left, to see the temples by day, and to New Delhi in the same plane early in the evening.

On the only Sunday I spent in New Delhi during that first trip, I signed up for the excursion, but the passengers were too few for a quorum and the plane didn't leave. In the ensuing years, Khajuraho has become world famous as a sort of licentious Angkor Wat, and now planes frequently go more than once a day and run on Saturdays, too. So signing up for the week-end flight to Khajuraho this time provided a new difficulty: it was hard to get seats on the plane. With the tourist director, whose enthusiasm for the temples has never dimmed in all these years, running interference, we did manage to get reservations. But inside the machinery of Indian Air Lines, this set off one of the greatest logistical scrambles since Hannibal prepared to cross the Alps by elephant.

A clerk from the airline called on Saturday afternoon to confirm that we were going. He called again in the evening to see that we hadn't changed our minds. After I had retired, the phone rang at midnight for still another check. Then at half-past five the next morning it shook the room with a wake-up jangle.

We drove out to the airport in the blackness. Dawn was having as much trouble getting up as I had. Standing in the dark and the chill in New Delhi's weatherbeaten old airport, one could only wonder about man's basic drives. The passengers were a mixed bag and not very many were enduring the discomforts in search of culture and beauty. Among them were: a pair of elderly American spinsters—retired schoolteachers, likely—who wore their hair in buns, clad their feet in sensible shoes, and were no less obtrusive than if they had showed up at an *exhibition* in a back room in Pigalle; a German with maps and cameras who would translate for a covey of German women who accompanied him; a well-tailored French textile manufacturer; and a chic Indian woman dressed in sari and carrying an alligator handbag from Hermes. She was accompanied by her college-age daughter.

Once aboard the plane, and wrapped in sweaters and woolens, we were cheered somewhat by a flyer given out by the stewardess. It must be one of the most unusual communiqués that any airline has ever issued to its customers. It reads:

KHAJURAHO

Dear Friend,

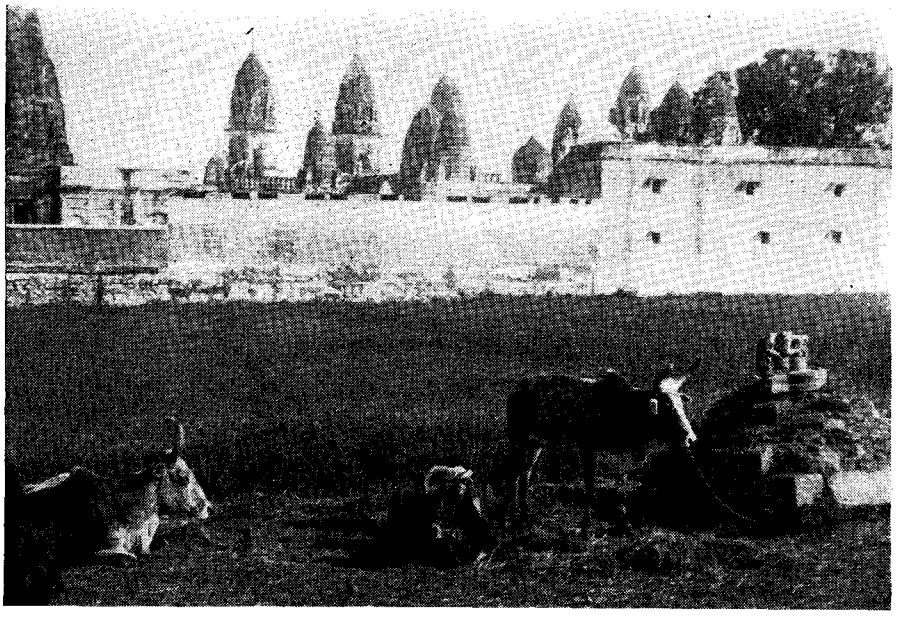
Thank you for flying with us. (As if you had any choice!)

But since you cannot, while in India, choose your airline, we give you a wide variety in aircraft; French Caravelles, British Viscounts, Dutch Friendships, American Douglases and very soon Avros made in India. As you can see, we have distributed our patronage fairly widely in the hope that our services would be patronised very widely.

You are now on board one of our DC-3s, a vintage aircraft specially preserved for "avant-garde" like yourself to "outre" places like your present destination. A Victoria ride in the Central Park is, we understand, very popular with the sophisticates and new towns

—H.S.

Khajuraho temples of love—sensuality preserved in stone.



—H.S.

In the heart of central India—lush reminders of an ancient dynasty.

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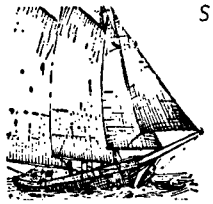
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We cannot tell you anything about Khajuraho. That is up to the Tourist Department. But we read somewhere that the erotic sculptures of ancient India make the paintings of Pompeii look like the posters at a Quaker meeting.

You will soon know.

Best wishes.

INDIAN AIRLINES

The DC-3 flight did not include a breakfast of ham and eggs and orange juice. In lieu of that we each were given a box breakfast gotten together with due respect for both Indian and Western tastes. It included an orange, a banana, and an apple, a roll that would have made a three-day-old bagel seem like a marshmallow, and two croquettes of uncertain origin filled like a spansule with unseen beads—I suspect of black powder —that went off with manifest, if delayed, authority.

AFTER a few hours the plane came down, not at Panna as it used to, but in a spare meadow, the new airfield near Khajuraho. There was little traffic at the airfield except for an elephant lifting timber that will form a terminal. A green bus waited, all painted with flowers on the outside. It had flowered linoleum on the floor, red curtains on the windows and pictures of Nehru and Gandhi over the dashboard. The tour was being run by an Indian Airlines officer, a Sikh in a blue airline uniform and with a turban.

—*Indian Airlines.*

The Sikh, who was to spend the whole day watching the timetable of our sightseeing in order to get the plane back to Delhi on time, shooed all the passengers on the bus. The co-pilot reached over and rang a buzzer twice and the whole rattling shebang took off down the dusty road. I could only think of Amos and Andy's Fresh Air Taxi Company, at the time when Andy had an office and a secretary. When the phone rang Andy would shout, "Buzz me, Miz Blue," and his secretary would buzz him to announce the call.

THE bus rumbled up in front of the guest house and the Sikh stood up and announced somewhat undecorously, "Five minutes for toilet." We gave the innkeeper our order for lunch, there being two choices, *veg* or non-*veg*. Then they hurried us into the bus once more. The buzzer rang twice, and we were off for the temples.

The Chandellas, who totally controlled Central India, had twenty rulers and three capitals. The sixth ruler established a religious capital at Khajuraho. The administrative capital was forty miles away and the military center, eighty miles away. In all there were, 1,000 years ago, some eighty-five temples rambling over eighty square miles. Of this great complex some twenty-two remain, thirteen in the Western group, seven in the Eastern and two in the Southern. The five best are in the Western group and it was these that we trooped off to see first.

Like much of Angkor, Khajuraho, which dates from the same period, is in a magnificent state of preservation. The carvings are delicate and at times, almost fey. While there are triumphal processions of great warriors and elephants marching to or from battle, there are also sensual poses of a girl scratching her back or removing a thorn from her foot. After nine centuries the scratches still show. Girls wrapped in silks arch their backs in an early *Playboy* pose. Bashful girls are shown covering their faces at the highly erotic scenes, leaving only enough room to see through their fingers. The erotica, carved into stone, display bizarre poses of man with woman, groups of men and women, and Sodomites and mares.

There was no rude giggling and no pointing, but there was considerable picture taking by all nationalities. Two Indian ladies at my elbow looked up at each carving and whispered quietly, "Sweet, sweet." There was little of that "feelthy peecture" hissing which is practiced by the guides at Pompeii. The Indian guide explained the theories of such boldness. Some theoricians insist that the people of the Chandellas era believed that the robust practice of sex

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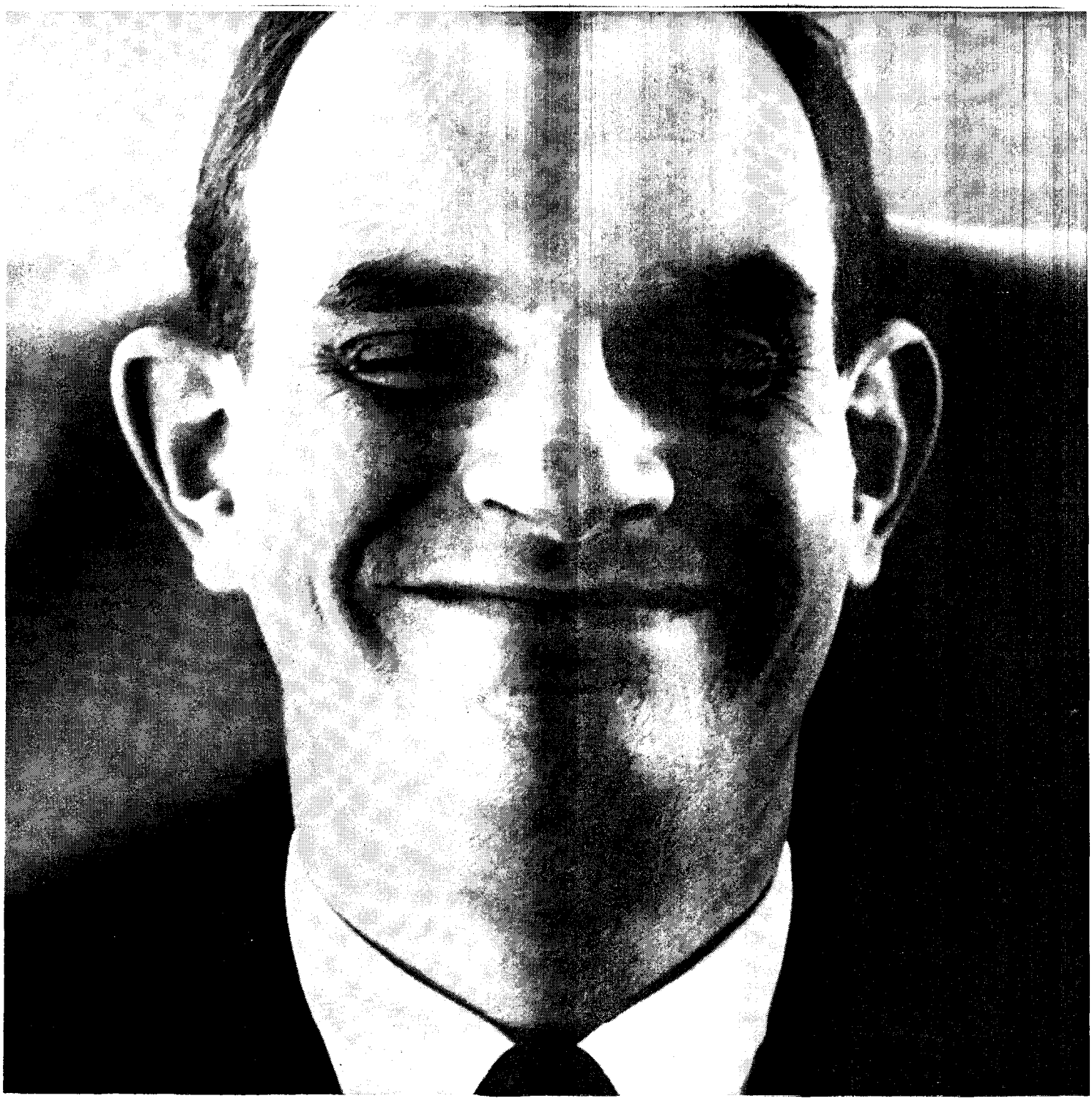

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would protect the temples from natural calamities: earthquakes and lightning, for instance. Others hold that it was nothing more than a ritualistic religious practice that helped transport the soul to Nirvana. More practical minds in the tourist department at New Delhi have said privately, and simply, that the carvings were little more than depictions of the most popular form of recreation of the period.

BY now the day that had begun in the cold and darkness of predawn had grown oppressively hot. It was noon and we emerged from the first half of the temple tour overburdened with clothes and parched with thirst. We searched the poor village for a bottle of cold water—even the Indians from Delhi refused to touch the water—and found none. By purest chance, here in the middle of central India, sixty miles from the nearest rail station, an old friend named Shyam Poddar, who has great plans for Khajuraho, and who was also on location, had decided to give a midday reception. A bus came to pick us up and we were conveyed down the dusty road to a clearing where a large carpet had been laid out, ringed with chairs. Servants stood alongside a washbasin filled with ice and beer, and an elephant, possibly the same one who had been at work on the terminal earlier that morning, was on hand for rides. Mr. Poddar, one of India's prime travel executives, knows his business.

As farsighted as a computer-minded Westerner, Poddar is planning to put up a hotel on the very site where we were taking midday refreshment. He apologized that the maharajah could not be there to greet us personally. A tiger had been spotted in the area, he said, and the lord of the land was off to bag it. Poddar and a small staff, he explained, were living in tents; if tigers or robbers didn't get them, they expected to start work on the hotel soon and would have it finished by the end of the year. It is to be built in five wings and will seem to float on a lagoon. To be called the Chandela, in honor of the rulers who created Khajuraho, it will have deep overhanging roofs to ward off the sun, but it will also become, upon installation of the cooling machinery, India's first air-conditioned resort hotel.

This new hotel, here in the dust-powdered Indian outback, also will have a swimming pool, a welcome appurtenance for guests in from the morning tour. A restaurant, floating on the moat and connected to the rest of the hotel by bridge, will overlook the pool and the landscaped Sunken Gardens. Original carvings from Khajuraho—the old quarry is said to be full of discarded pieces—will decorate the lounge. With his plan well in work, all Poddar needs now is to have the government pave the airstrip so that it can be used in all seasons, and then talk Indian Airlines, the domestic carrier, into a stop at Khajuraho on the regular Calcutta-New Delhi run.

Cooled by beer and heady with Poddar's imaginative ideas, we drove back to the tourist bungalow and had lunch with Frances Knight, head of the U.S. Passport Agency, and her husband Wayne Parrish, the aviation magazine publisher, who also were on tour. With forethought about which I roundly congratulated myself, we augmented the hotel's blue plate special, which did not exactly resemble a platter prepared by Lapérouse, with a box lunch ordered from the Oberoi in New Delhi.

Our old friend the Sikh officer was shortly rounding up his herd. We were once more back on the bus, bells were ringing, and we were soon off to the Eastern group of temples built in the middle of the eleventh century by the eighth ruler of the Chandellas. This group, quite near the village, was considerably different in mood and aspect from the temples we had seen in the morning. They were, for one thing, enclosed in a white compound, and visitors were required to remove their shoes at the gate. Three of the temples are Jain. In Jain temples there are no erotica. Although Buddha wears a thin veil, the Jain god, having renounced everything, wears nothing.

—*Government of India Tourist Service.*

Khajuraho woman decorating her foot with paint in preparation for dancing.

The compound is surrounded by a wall, but from the temple steps we could look over it and see poor farm cottages and the waving fields of tall, bright green grass. Through the reeds as we watched came a middle-aged woman wrapped in a red sari. She wailed loudly as if hurt, yet her step never faltered, nor did she look back. She was the mother of a bride who had just left her village, and the mother was expressing to the world the sorrow of her loss. In the distance, heading away, we could see the bride carrying her bundles and walking determinedly toward the home of her groom.

There was time now only for a fast look at the Southern group, the most recent temples of all. The carvings were there, but the spirit and the talent were gone. The bas reliefs were more decorated, more ornamented, but the figures lacked the facial expressions so vivid and real in the Western temples. The best I remember of our last stop is a sword hung over the altar that would slice any bat who deigned to invade such a sacred corner.

BACK in the bus, we trundled out to the airfield. In the center of an enormous crowd stood our little DC-3. Men and women were being allowed a look at this modern marvel, and young boys, somewhat to my apprehension, were playing with the flaps and rudder. A policeman with a stick finally drove a hole in the crowd to allow us through. But first, from the portal came a stream of Indians, pouring from the plane like the occupants of a Marx Brothers taxi. In the rear of the mob stood the elephant. Someone had brought him to say goodbye, too.

Rather to my astonishment the plane got off the ground and when we looked down we could see those wondrous faces looking up at the phenomenon, a twenty-five-year-old airplane that had lifted itself off the ground and was flying above them. One could only imagine with what awe they will one day gaze upon Poddar's air-conditioned hotel, complete with swimming pool and balconies hanging over the water, not to mention the screaming Viscounts that will land on the hard-surfaced runway—provided, of course, that the Chinese remain tranquil, the Paks stay unruffled, and India doesn't lose its imagination or its drive.

—HORACE SUTTON.

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(TRAVEL)

The Asian Name Game

IF NEWSPAPER READERS are frequently bewildered by current events in the Far East, it may be simply that Oriental names are too complicated. After all, nobody leaning over his breakfast *Times* is in much of a mood to distinguish between the Malaysian Prime Minister, Abdul Rahman, and his deputy, Abdul Razak, not to mention His Majesty Tuanku Ismail Nasiruddin Shah ibni Al-Marhum Sultan Zainal Abidin. Nor do commuters have the patience to sort out the Laotian Premier, Prince Souvanna Phouma, his Communist half-brother Prince Souphanouvong, his rebellious ex-defense minister General Phoumi, and his main rival, former premier Phoui (whose name, incidentally, is not pronounced "phooey"). It is similarly baffling to learn that India's Prime Minister, Mrs. Indira Gandhi, is not related to Mahatma Gandhi; she is the late Prime Minister Nehru's daughter.

Happily, conditions have vastly improved since antiquity, when Oriental potentates preened themselves by inventing glorious pseudonyms. In the tenth century, for instance, a Burmese emperor took the name Sri Tribhuwanadityadhammarajarajadhirajaparamiswarabalacakkrawar, which, among other things, signified "supreme king of kings, overlord, mighty universal monarch." His fate at the hands of a modern editor would be brutal.

Names tell a good deal about countries and their people. The enormity and puzzling diversity of India, for example, is reflected in its immense variety of names, which may denote, among other things, an Indian's regional origin, religion, caste, profession, and education. Banerjee, Chatterjee, Mukerjee, Mookerjee, Mukherji, Mookerji and Das are very likely Bengalis from eastern India, the assorted Mookherjees probably being Brahmins. In western Maharashtra, names rhyme differently: Ambekar, Dandekar, Gajendragadkar. Sikhs are usually called Singh, which means "lion," but so are many Rajputs from the Punjab. The Parsees, mostly centered in Bombay, have adopted ancestral occupations as names, and of an evening it's common to encounter a Mr. Engineer or a Dr. Doctor. The late Prime Minister Shastri's name was not a name at all, but the designation for a college degree, as if he were called Mr. Bachelor of Arts.

Thailand is a country where pronunciation defies spelling. The name of the solemn young king, Bhumibol, sounds rather like "funnybone." By contrast, singleton Indonesian names are fairly easy to retain. When in doubt, everyone is *bung*, or "brother." In the Philippines, four centuries of Spanish rule were overlaid by a couple of generations of American colonial influence, leaving a curious combination of Latin formality and Yankee familiarity. Gentlemen with names like cigar brands—Perfecto, Eufronio or Benedicto—are known as Joe, Mike, and Butch.

In ancient Japan, lengthy names were considered auspicious; to abbreviate them invited bad luck. According to one old Japanese myth, a farmer was so ambitious for his young son that he endowed him with a name that required fifteen minutes to recite. One day, workers in a field rushed to alert the father that the boy had fallen into a well. But the farmer refused to listen until his son's name was orated in full, and that ritual took so long that the boy drowned.

Such antique ways have long since been abandoned by the adaptable Japanese, however. Indeed, they are probably as receptive to fads as southern Californians. After the 1964 Olympics, for example, thousands of Japanese boys were named Seiko or Seiji, which vaguely means "sacred torch," or Katsutoshi, which signifies "victory." Many boys are also called Heshinku, a Nipponization of Geesink, out of respect for the huge Dutchman who beat the Japanese at their own game and won the gold medal for judo, open weight class.

In times past, many Chinese also responded to Western fashions. Missionary schoolteachers had much to do with endowing Chinese children with ornamental, often heroic names such as Washington Wong, Chaucer Wu and Wellington Koo, as a former Chinese Ambassador to the U.S. was called. They also encouraged Chinese to translate and transliterate their names. For instance, *shih* means "stone" and *mei-yu* sounds somewhat like Mary; thus the well-known Chinese woman doctor, Shih Mei-yu, was transformed into Mary Stone. Even now in Hong Kong, a British colony, Chinese frequently Anglicize their names to give themselves business trademarks, or simply to adopt a western cachet. The celebrated Chinese movie actress Lin Dai, who died last year, was known to her friends as Linda; a wealthy tea merchant calls himself Lipton Chong.

Many Chinese assume names that, they feel, befit their temperament or aspirations. The Nationalist leader Chiang Kai-shek is fond of the pseudonym Chiang Chung-cheng, which means "upright and steady." To intimate acquaintances, the Communist leader Mao Tse-tung is Jun-chih, a rather poetical, untranslatable name that somehow connotes the moist brush of a scholarly calligrapher. One of the tricks in choosing a Chinese name lies, of course, in the proper manipulation of Chinese ideographs. An American called, say, Ponsonby, who wants a Chinese rendition of his name for his calling-card, may find that the characters signify "stupid pig." With only a few deft strokes, an expert can alter them to mean "wise philosopher contemplating a peach blossom."

Possibly the most confusing names in the Orient adorn the Vietnamese. Like the Chinese, they technically put their surname first, but in practice they reverse the order. Westerners trying to keep track of this name-switching can take consolation in the fact that it perplexes the Vietnamese themselves. For the sake of clarity, they labelled their former head of state, General Duong Van Minh, "Big Minh," because he was taller than the army chief of staff, General Tran Van Minh, whom they called "Little Minh." Oddly enough, the president of Communist North Vietnam, Ho Chi Minh, is invariably known as Ho. But should he ever become embroiled in the complexities of Saigon, he's bound to be cut down to "Medium-Sized" Minh.

—STANLEY KARNOW.

EDITOR'S NOTE: *Stanley Karnow is the Washington Post's Hong Kong correspondent.*

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Bolshoi, Balanchine, and Brahms

FOR A SPRING CHECK-UP of the dancing mechanism, nothing suits better than a measurement by the standard of the Bolshoi Ballet, which is presently beginning its third American tour with an engagement in the Metropolitan Opera House. Whether the challenge relates to attitudes, arabesques, pirouettes, jumps or beats, what they do and how they do it are criteria by which not only every company but every member of it can be scrutinized, evaluated and, if possible, improved.

Now that we are seeing them for the third time in eight years, in the dozenth item of their repertory, it is increasingly clear that how they perform is vastly more important than what they perform. That is, the style—agile, disciplined, vaulting, airborne—remains much the same regardless of the name of the ballet. The scenery they bring with them is as drab as ever, the costumes antiquated, the make-up sometimes grotesquely old-fashioned. But to watch a stageful of Bolshoi dancers at work is to realize the fine art to which bodily discipline has been raised in the schools which produce this order of excellence. Too bad that it all goes on in an esthetic vacuum, where there has, apparently, been no air and very little light for decades.

What is most absorbing is that above the general level of excellence there remains the rarefied "outer space" where, still, only the super-gifted can penetrate. When the company was first seen here in 1959, it was apparent that Galina Ulanova was leaving this special realm behind her (at nearly fifty) and, as she coursed downward, Maya Plisetskaya was moving up to meet and pass her. On her return this third time, Plisetskaya leaves no doubt that she has become firmly established in an orbit of her own, a free-wheeling space vehicle not to be confused with any other.

In the present engagement, Plisetskaya was thoughtfully included on the opening program, thus establishing immediately the super-standard by which the ordinary could be measured. According to company literature, "The highlights evenings are among the most exciting of the Bolshoi's programs." This applied to the opening bill itself which, if not the random collection of excerpts of several works to which the term "highlights" is commonly applied, was nevertheless a compilation of excerpts from one work entitled *Swan Lake*. It is, like other "highlights" programs, made up of star turns, showy *pas de deux*, waltzes, mazurkas, etc., but it is very little like a consecutive, dramatic entity commonly thought of as *Swan Lake*.

Thus the drama of the evening was provided not so much by the Swan's confrontation of the Prince, but by Plisetskaya's response to the duality in the roles of Odette and Odile. Whereas she had, in previous years, tended to embody the sharp, pointed, menacing movements of the Black Swan (Odile) in both parts, her White Swan has now evolved into something more melting (if hardly tender), with a rippling continuity of arm movement which is more water fowl than merely birdlike. If scarcely paralleled by any predecessor (Fonteyn's, in her prime, had other superiorities), it is also part of a highly effective demonstration of muscular virtuosity, in which body (back bends, attitudes on point), limbs (swift shuddering steps across the stage like a master violinist's staccato) and head (preening movements to the shoulder) are blended into a vibrant whole. But the key to it—including the flouncing bows and skittering exits—is the totality itself, which remains theatrically effective rather than emotionally persuasive.

It could, indeed, hardly be otherwise, considering the limp Prince of Nikolai Fedeyechev, the exaggerated Rothbart of Vladimir Levashev and the intrusive Jester (a peculiarity of this Gorsky-Messerer version) of Vladimir Koshele. Maya Samokhvalova is, of course, a superior dancer in her specialities, but the other elements, including the overstressed conducting of Alexander Kopylov, made one wonder whether the Soviet performers are, truly, to be trusted with the preservation of their heritage.

If the Bolshoi's *Swan Lake* without Plisetskaya is barely imaginable, its *Don Quixote* without her would be unendurable. A holdover from that period of balletic glory in Russia when new creations were produced as often as necessary and the necessity was practically incessant, it survives elsewhere as the source of a grand *pas de deux* whose circusy evolutions have become familiar in recent years.

At that, it could not be said that one was out of step with the other. Don Q. and Sancho Panza appear at the beginning, the middle, and the end of this affair, and at fifteen- or twenty-minute intervals in between; but, for the most part, the Gorsky version of the Petipa original is a mad whirl of solos and ensembles, many with a Spanish flavor, and almost as many without.

Amidst them all, Plisetskaya's presence, as the daughter of an innkeeper whose hospitality Don Q. enjoys for a while, stands out like an evergreen in a field of dwarf maples. She manages, as much by animal energy and physical magnetism as by the exhibition of her incomparable bodily discipline, to provide a focus of attention where otherwise there would be none. Indeed, when the celebrated *pas de deux* arrives in Act III, it is almost, if not quite, an anti-climax. Her partner here, as in so much that preceded, was the excellent Vladimir Tikhonov, whose Barber (a suitably proletarian suitor who interests her more than the nobleman she rejects) displays great strides forward since he was seen in a troupe called "Stars of the Bolshoi" several years ago. Others of outstanding quality included Natalia Ryzhenko, a glowing young blond who danced one of the principal performer's "girl friends," and the indispensable Samokhvalova. Taken together with Minkus's tunefully undistinguished score, it could have been danced on the stage of the Radio City Music Hall and not been out of place.

To span the distance from the Bolshoi at the Metropolitan to the New York City Ballet at the State Theater on the same evening is to move, in a ten-minute cab ride, from a museum of perfectly preserved antiquity into something like the light of day. When the musical context is Minkus to Brahms, the light is almost blinding. Currently the New York City Ballet is presenting Balanchine's reflections on the G-minor Piano Quartet (Opus 25) as reworked for orchestra by Arnold Schoenberg.

An extension of the impulses well-known from such other works of Balanchine as *Ballet Imperial*, *Serenade*, and *Symphony in C*, it is as empty of "meaning" as the stage is of scenery, but no less compact of sense, order and visual delight. Essentially a "company" ballet rather than a work to the advantage of any individual, it initially offends by offering a tantalizing glimpse of Melissa Hayden in movement one, and not bringing her back thereafter. However, since Patricia McBride and Conrad Ludlow shared the opportunities of the Intermezzo, Allegra Kent and Edward Villella wove in and out of the texture of the Andante, and Suzanne Farrell and Jacques d'Amboise spiced the Rondo alla Zingarese finale, one would have to concede that partiality to Miss Hayden would be excessive.

What Robert Irving did with the musical score against the grey decor by Peter Harvey and the pink-and-silver costuming by Karinska left one mulling all the other possibilities open to Balanchine in chamber music literature—sixteen quartets by Beethoven, twenty-odd by Mozart, eighty-three by Haydn.

—IRVING KOLODIN.

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SR Recommends

BOOKS

Nonfiction

VIETNAM: BETWEEN TWO TRUCES, Jean Lacouture; tr. from the French by Konrad Kellen and Joel Carmichael. Random House, $5.95 (*SR*, Apr. 9)—The author cites data from recent history in support of his belief that a peace negotiated between the two Vietnams (without the "help" of world powers) would not turn the South over to Communism.

NJEGOS: POET, PRINCE, BISHOP, Milovan Djilas; tr. from the Serbo-Croatian by Michael B. Petrovich. Harcourt, Brace & World, $10 (*SR*, Apr. 30)—From his prison cell, the Yugoslav rebel vividly brings to life Montenegro's nineteenth-century ruler and assesses his considerable merit as a poet.

JAMES BOSWELL: THE EARLIER YEARS, 1740-1769, Frederick A. Pottle. McGraw-Hill, $12.50 (*SR*, Apr. 30)—The man who probably knows more about Boswell than anyone else draws upon unpublished material to provide new insight into his paradoxical character.

ERNEST HEMINGWAY: A RECONSIDERATION, Philip Young. Pennsylvania State University Press, $5.95 (*SR*, Apr. 9)—This edition includes Hemingway's reaction to Young's original study, published in 1952, and an examination of the novelist's decline.

PAPA HEMINGWAY, A. E. Hotchner, Random House, $5.95 (*SR*, Apr. 9)—This extraordinary memoir evokes the vigorous joy that Papa obtained from life before the mental disintegration in which he ended it.

FIRE UNDER THE ASHES: THE LIFE OF DANILO DOLCI, James McNeish. Beacon, $5.95 (*SR*, April 9)—A co-worker delineates the strengths and the weaknesses of the reformer whose work and writings have brought the economic plight of Sicily to world attention.

FLORA: A BIOGRAPHY, Elizabeth Gray Vining. Lippincott, $4.95 (*SR*, April 9)—A careful but never dull account of the life of Flora MacDonald, who smuggled Bonnie Prince Charlie, disguised as her maid, out of England in 1746.

NEWTON ARVIN: AMERICAN PANTHEON, ed. by Daniel Aaron and Sylvan Schendler. Delacorte, $6.75 (*SR*, Apr. 9)—Assembles previously uncollected reviews and articles by the critic and biographer of nineteenth-century U.S. writers.

THE DIVINE ARETINO, James Cleugh. Stein & Day, $6.95 (*SR*, Apr. 16)—The morals and manners of the Renaissance are delightfully recaptured in this biography of a highly successful practitioner of the art of extortion.

THE CHALLENGE OF CHANGE, Edward W. Brooke. Little, Brown, $5.95 (*SR*, Apr. 23)—The attorney general of Massachusetts and a would-be Republican candidate for the Senate minces no words in pointing to the failings within his party.

THE FRENCH, Jean-François Revel; tr. from the French by Paula Spurlin. Braziller, $4 (*SR*, Apr. 23)—The Gaullist phenomenon and France's lack of liberty, fraternity and equality are venomously and wittily attacked by a left-wing observer.

HAMMARSKJOLD, Emery Kelen. Putnam, $5.95 (*SR*, Apr. 23)—A former senior member of the United Nations staff concentrates, dispassionately, on the late Secretary General's messianic sense of mission.

THE MYSTIC IN THE THEATRE: ELEONORA DUSE, Eva Le Gallienne. Farrar, Straus & Giroux, $4.50 (*SR*, Apr. 23)—Maintains that the actress's life and work were motivated by a transporting spiritual search.

THE STATE OF THE NATION, ed. by David Boroff. Prentice-Hall, $5.95 (*SR*, Apr. 23)—Articles by twenty-two writers taken from the 100th anniversary issue of the *Nation* add up to an uneven but often discriminating judgment of civilization in the U.S.

TALK STORIES, Lillian Ross. Simon & Schuster, $5.95 (*SR*, Apr. 30)—Collects sixty gems from the author's Talk of the Town "casuals" for *The New Yorker*.

Fiction

A GENEROUS MAN. Reynolds Price. Atheneum, $4.95 (*SR*, Mar. 26)—Portrays with tender and humorous insight the complexities that contribute to a youth's metamorphosis into manhood.

THE CRYING OF LOT 49, Thomas Pynchon. Lippincott, $3.95 (*SR*, Apr. 30)—The author's second novel is about a tenth as long as *V*, considerably easier to follow, and just as funny.

A LAST LAMP FOR BURNING, Gwyn Griffin. Putnam, $6.95 (*SR*, Apr. 16)—In its re-creation of the particular atmosphere of Naples after the Second World War, this briskly paced novel provokes thought about the human condition everywhere.

FORBUSH AND THE PENGUINS, Graham Billing. Holt, Rinehart & Winston, $3.95 (*SR*, Apr. 9)—A strange and compelling first novel concerning a naturalist who during a five-month solitary stay in the Antarctic becomes involved in the penquins' desperate struggle against extinction.

THE COMPETITOR, Thomas Bontly. Scribners, $3.95 (*SR*, Apr. 9)—This novel, another first, makes meaningful a day in the life of a shoe salesman who is being outsold by a younger man.

SAGARANA, João Guimarães Rosa; tr. from the Portuguese by Harriet de Onís. Knopf, $5.95 (*SR*, Apr. 16)—Nine short stories, all of them beguiling, some of them masterpieces, by the man Brazilians consider their finest writer.

FIVE WOMEN, Robert Musil; tr. from the German by Eithne Wilkins and Ernst Kaiser. Delacorte, $5 (*SR*, Apr. 16)—A quintet of short stories about love by the recently rediscovered author who has been compared to Proust and Mann for the depth of his psychological insight if not for his facility with words.

THE SECRET SWINGER, Alan Harrington. Knopf, $4.95 (*SR*, Apr. 23)—Another man leaves wife and job to seek self-fulfillment. The end leaves us with a puzzle, but also with a sense of having been hit hard.

THEATER

SERJEANT MUSGRAVE'S DANCE, THE MARAT/DE SADE, INADMISSIBLE EVIDENCE, THE ROYAL HUNT OF THE SUN, PHILADELPHIA, HERE I COME!, CACTUS FLOWER, MAN OF LA MANCHA.

ART

Exhibitions

PAST AND PRESENT: 250 YEARS OF AMERICAN ART, Corcoran Gallery, Washington, D.C. The exhibition of more than 700 works, ranging from 1718 to the present, is almost entirely drawn from the Corcoran's permanent collection and demonstrates how comprehensive is the museum's coverage.

SEVEN DECADES — 1895-1965 — CROSS CURRENTS IN MODERN ART. At ten Manhattan galleries. Three-hundred and seventy major works by important American and European artists of the last seventy years trace the development of modern art, decade by decade.

PAINTINGS BY ARTHUR DOVE, Phillips Collection, Washington, D.C. This group of works by America's pioneer abstractionist, all owned by the Phillips Collection, is only one of the many splendid concentrations at this unique museum

PHOTOGRAPHY

Exhibitions

MARIE COSINDAS: POLAROID COLOR PHOTOGRAPHS, Edward Steichen Photography Center, Museum of Modern Art, New York; after July 4 at Chicago Art Institute. Forty-five cameo-like prints—still life and portraits—reveal this artist's mastery of a new medium, easily establishing her as the poet-laureate of Polacolor.

THE NATURAL IMAGE, IBM Gallery, New York. In the fine classic tradition set by Edward Weston and Ansel Adams, Brett Weston captures nature's lyrics of light.

PICTURES OF THE YEAR, National Geographic Society, exhibit hall, Washington, D.C. Courtesy of the nation's largest competition for newspaper and magazine photographers, this show of newsworthy award-winners serves also as a visual *aide-mémoire* to what made news in 1965.

MOVIES

LENINGRAD-KIROV BALLET "THE SLEEPING BEAUTY." A stunning production enriched by lavish settings, beautiful color, and an accomplished ensemble. One of the best ballet films yet.

THE SUCKER. (*SR*, Apr. 30) A French extravaganza starring Louis De Funes as the innocent driver of a car whose bumpers are filled with illegal gold, its fenders with heroin, and its battery with stolen gems.

HARPER, THE GROUP.

Soursop

By Nancy Price

WHO named them Dock, Dodder,
Corpse-plant, Clammyweed,
Toadflax, Fat-bellies, Horned Bladderwort, Spotted Cowbane, Tickseed,
Greasewood, Hairy Vetch, Stonecrop?
Lovers, found flowering innocently, are given such names with a vengeance, but who envied Soursop that much?

PRODUCED 2005 BY UNZ.ORG
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26 SR's Check List of the Week's New Books
87 Literary Horizons: Granville Hicks discusses usage
88 Letters to the Book Review Editor
89 "Earthly Paradise: An Autobiography of Colette," drawn from her lifetime writings by Robert Phelps
90 "In My Father's Court," by Isaac Bashevis Singer
91 "The Diary of Anaïs Nin," edited by Gunther Stuhlmann
92 "The Politics of the Chinese Red Army," edited by J. Chester Cheng
93 "Death in Midsummer and Other Stories," by Yukio Mishima
94 "A Sentence of Life," by Julian Gloag. "Alberta Alone," by Cora Sandel
95 "The Doctor Is Sick," by Anthony Burgess. "Gascoyne," by Stanley Crawford
96 "Behind Closed Doors," by Edward N. Costikyan
97 "Southerner," by Charles Longstreet Weltner
99 The Shackles of Power: Three Jeffersonian Decades," by John Dos Passos

LITERARY HORIZONS

The Wrong Word for It

EVER since I reviewed Theodore Bernstein's *The Careful Writer* (*SR*, July 17, 1965), I have kept a list of words, phrases, and sentences encountered in my reading that raised questions of grammar or of usage. I am a little uneasy about publishing the list, for I know, having suffered at their hands, what amazing things copy editors, printers, and proofreaders can do. Therefore I apologize in advance to any writer who is not responsible for the fault that I attribute to him.

I find it difficult, for instance, to believe that Daniel Aaron wrote, "His own esthetic criteria emerges . . . ," and yet that is what I find in his introduction to the posthumous collection of Newton Arvin's essays, *American Pantheon*. There is a slip of the same sort in Alfred Appel's book about Eudora Welty, *A Season of Dreams*: "She is a kind of Magi."

I am so used to hearing "like" for "as" on television that my ear scarcely notices it, but my eye is startled when I read such a sentence as this: "In saying the Jesus prayer, she has been trying to lay up spiritual treasures for herself much like the people she is criticizing are trying, in one way or another, to lay up material or intellectual treasures for themselves." (James E. Miller, Jr., *J. D. Salinger*, in University of Minnesota Pamphlets on American Writers.)

"Who" and "whom" continue to trip the unwary. Sherman Paul wrote in his book on Edmund Wilson: ". . . when, in fact, he had more in common with Michelet whom he said was. . . ." And James Gould Cozzens, of all people, wrote in *By Love Possessed*: "Unlike Warren (who, I know now, I brought to despise me) . . ."

In *Guard of Honor* Cozzens wrote, "The building was left truncated, reduced to the center wing . . ." Maybe in talk about buildings that's all right, but I keep trying to visualize a bird with a center wing. In *The Lockwood Concern* John O'Hara falls into an ancient trap, against which all books on usage warn us: "This circumstance was a fortuitous one for Abraham Lockwood." In *The Wizard of Loneliness* John Nichols tells us that "the doctor felt as if he were being consummated by fatigue." The word Nichols wanted, I presume, was "consumed." Doris Lessing in *A Ripple from the Storm* says someone was worried because "tools of Moscow were fermenting revolution among the blacks." I should have assumed that revolution was being"fomented," but Bergen and Cornelia Evans, in their *Dictionary of Contemporary American Usage*, point out that the distinction between the two words is not perfectly clear, and they would say that revolution could be "fermented."

Muddled sentences turn up all the time, but there is one in Alfred Kern's *Made in USA* that makes me a little dizzy: "Cogdell was kind enough to give them the benefit of his recent reading and more important his thinking of which he had done an abundance of both."

There are slips of many kinds. In *Of the Farm* John Updike's narrator speaks of "a gesture that when I was a child reminded me of that mysterious sentence in the Bible about the moving finger, having writ, moving on. . . ." I was sure there was a moving finger in *The Rubaiyat of Omar Khayyam*, but for all I knew there might be one in the Bible, too. However, *Cruden's Complete Concordance* knows nothing about it, and the *Oxford Dictionary of Quotations* lists only the *Rubaiyat* under "moving finger."

The moon gives great trouble to a number of writers, who have never learned that the moon's phases follow definite laws. In *The Day of the Waxing Moon* Marian Skedgell writes: "They came to the crest of a hill, and she saw before her, riding low in the whitish-blue sky, blanched by the harsh midday sun, a paler orb of white, barely visible. There would be a full moon tonight." If the moon behaved in that erratic fashion, man's chances of reaching it would be slight indeed.

Berta and Elmer Hader once wrote a charming book for children called *Wish on the Moon*. All the little animals gather to wish that their human benefactors will have a successful garden. Sure enough, the new moon rises in the east soon after sunset, just when a well-behaved new moon would be setting in the west.

One of the most famous writers to have trouble with the moon was Samuel Taylor Coleridge, who, in *The Rime of the Ancient Mariner*, speaks of "The horned Moon, with one bright star/ Within the nether tip." If I remember correctly John Livingston Lowes's *The Road to Xanadu*, Coleridge got the idea from the writings of that sober New England preacher and scholar Cotton Mather, who had reported just such a phenomenon.

Some writers like to play word games, and that is their privilege. Reviewing Stephen Becker's *A Covenant with Death* (*SR*, Jan. 9, 1965), I listed some of the unusual words to be found in the book: gossipaceous, laetificiant, temulating, lallations, boryborygmus. A correspondent wrote that he thought he could interpret all but "boryborygmus," and could I enlighten him about that? I couldn't, and I wonder if any reader

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can. (Of course, I could write and ask Mr. Becker, but that wouldn't be playing fair.)

Various critics have commented on James Gould Cozzens's vocabulary in *By Love Possessed,* and I have noted some of the less common words: volumed, prebyopic, rencounter, relucted, piacular, autoptic, volitations, vellications, furibund, longanimous. It might be pointed out that Cozzens's vocabulary had begun expanding by 1924 when, in his twenty-first year, he published *Confusion,* in which we find trepid, rescission, tergant, and macilent. In other novels of his I have run across dispendious, comminuted, and anamorphosis.

Nicholas Samstag, in reviewing John Fowles's *The Magus* (*SR,* Jan. 15, 1966), notes almans, accipitral, and swaling. In addition the reader may run into acroterion, kylix, and rhyton.

In *The Embezzler* Louis Auchincloss uses a word that, so far as I can make out, he has invented: ". . . representing everything that had driven her to near expatriotism." It could be useful.

Every time I write a piece on usage I know that I am going to receive half a dozen letters pointing out the terrible crimes I have committed. Well, why not? This is a game that any number can play, and, if my experience is any indication, the number of people who do play it is large. It is difficult to avoid hair-splitting, but even that is preferable to slovenliness. No matter what thinking machines may be invented, language is our principal tool for communication, and we do well to keep it sharp.

—Granville Hicks.

FRASER YOUNG'S LITERARY CRYPT No. 1187

A cryptogram is writing in cipher. Every letter is part of a code that remains constant throughout the puzzle. Answer No. 1187 will be found in the next issue.

WXNL-WPZIQLQZX XYPKNXW

RW GU WPZIQLQZX UGMXI

CXUCNX SQGMURG KNRWMQYF.

—WMPS

Answer to Literary Crypt No. 1186

Men are not hanged for stealing horses, but that horses may not be stolen. —Lord Halifax.

LETTERS TO THE Book Review Editor

Illiteracy

In dropping "of Literature" from your title, was it foreseen that *SR* was drifting to illiteracy? From your issue of Apr. 16:

P. 41 (Samstag on Beebe) "At the very beginning of this posthumous work . . ." Posthumously *published,* yes—but even Lucius had certain mortal limitations.

P. 47 (Clements on Cleugh) ". . . not only would princes uneasily provide him with creature comforts, including endless women . . ." Does this mean "bottomless," as in without a bottom (hardly the best kind); or women who began at, say, ground level, and whose heads were lost in the unmapped infinities of space; or women who never died or, worse yet, women who, once in bed, never ended what they were about? . . .

Nit picking? Of course. But it does diminish the authority of a reviewer of books in English to fail to write English.

Henry Stern.

E. Palo Alto, Calif.

Editor's note: *Webster's International, Second Edition Unabridged, offers as definition 2. for posthumous: "Published after the death of its author; as posthumous poems." The same source gives these definitions for endless: "2. Without limitation . . . 3. Numerous; many . . ."*

Yankee Doodle Daughter

For many years I have been reading *Saturday Review* in my doctor's office. You can imagine my surprise when I turned to page 50 of the April 16th issue and read about my campaign to clean up America from my book, *The President I Almost Was.*

However, I must tell you that I am not from Brazil but the United States, otherwise how could I run for President of this country? So please tell your readers that I am not a Braziller as your magazine printed. Thank you.

Yetta Bronstein.

New York, N.Y.

Editor's note: SR *erred in crediting Braziller with publishing Mrs. Bronstein's memoir, which is a Hawthorn release.*

Uniquely Petrakis

In Literary Horizons [*SR,* Mar. 12] Mr. Granville Hicks observes that my collection of short stories, *Pericles on 31st Street,* was, as a whole, mediocre, and he saw no reason why it should have been one of the fiction books nominated for the National Book Award.

I am happy to grant Mr. Hicks the right to his critical opinion and hope he does not think me too scurrilous a bounder for accepting the nomination without shame. If it served no other useful function after nine years in which I have published four books and perhaps fifty stories, the nomination did finally serve to bring me to the notice of Mr. Hicks. . . . I can only hope that having snatched me from the lonely Midwestern sentryposts of literature to examine my qualifications for a citation, Mr. Hicks does not order me back to the line with a peremptory reprimand. The charge of mediocrity deserves a hearing.

My new novel, *A Dream of Kings,* has been completed and will be published by McKay in late August. . . . Having drawn a bubble of blood Hicks may be able to finish me off. Or perhaps find himself provided with a magnificent opportunity to admit that if I am not Tolstoy, I am, after all, Petrakis.

Harry Mark Petrakis.

Chicago, Ill.

Chief of Consensus

It is an incredible experience to read a review of our *The Lonely Quest: The Evolution of Presidential Leadership* [*SR,* Apr. 16] constructed on a fanciful observation that doesn't appear in the book. We never by any stretch of the imagination inferred that to fulfill his titular role of "President of all the people," a President should, therefore, "offend none of them," or that he must therefore "blur the issues and differences between the parties" or even "neglect the party machinery and avoid his party's leadership."

But Walter Johnson, the reviewer, pins this superficial and stupid assumption on us and sagely chides: "Whenever a President has tried to function solely or mainly as the 'President of the people' he has failed to provide the leadership the country needed to cope with bewildering economic, social, and technological change."

May the Lord deliver the nation from any such superannuated figurehead, even as he has delivered the authors from any such vacuous assumption.

I quote from page 247 of *The Lonely Quest:*

> On the one hand, the President stands for all those values, concepts, and understandings that draw us together as a people. He is the Chief of Consensus . . . it is a matter of articulating the common commitment of a whole society.
>
> On the other hand, the father of all the people must repeatedly act the role of political advocate and leader of one segment of the population. This, too, is an honorable role.

As we pointed out with great elaboration, it will be the thoughtful and public-spirited urban citizens who must blend and mediate these two roles to the benefit of the whole nation.

Robert Rienow.

Selkirk, N.Y.

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A Woman's Moments of Awareness

Colette—"a well-nourished country girl...

Earthly Paradise: An Autobiography of Colette, *drawn from her lifetime writings by Robert Phelps, translated from the French by Herma Briffault, Derek Coltman, and others (Farrar, Straus & Giroux. 505 pp. $6.95), encompasses the novelist's life from her country girlhood to her death at eighty as the doyenne of French letters. Anna Balakian, the author of "Surrealism: The Road to the Absolute," is professor of French at New York University.*

By ANNA BALAKIAN

THIS collation of autobiographical writings by Colette encompasses many of the high points which she herself would have chosen as most characteristic of Colette the woman and Colette the writer. If there are gaps in the sequence of events, the continuity of what she really considered her life is preserved: "a series of moments of awareness"; and her main objective in writing is conveyed: "to add my personal contribution to the sum total of our knowledge of the senses."

Sidonie-Gabrielle Colette walked and worked among the giants of the French literary world of the first half of the twentieth century. A contemporary of Proust, Gide, Claudel, Valéry, and others now rivals for immortality, she was, in 1954, one of the last to disappear of a generation renowned for its longevity as well as for its diversity and productivity; among them she was the only woman to hold her own. As these writings reveal, Colette was not a writer who happened to be a woman, but a woman who happened, almost by accident, to become a writer. Her happy childhood as a wholesome, well-nourished country girl, brought up by liberal, civilized parents, gave no intimations of a literary career:

> There was no railway in my part of the country, no electricity, no college or big city nearby. In my family there was no money, but there were books; no gifts, but there was tenderness; no comfort, but we had freedom. No voice borrowed the sound of the wind to whisper into my ear, along with a gust of cold air, the advice to write and write, to dim by writing about it my thrilling or tranquil perception of the living universe.

It is amazing to note in one so totally feminine in her view of life the recurrent apprehension that she might be considered "masculine" because of her intellectual activities. The truth is that all the overt manifestations of masculinity on her part were expediencies: she occasionally wore masculine attire on the stage to earn a living; her Lesbian inclinations filled the gap left by unfaithful men in the life of a being for whom love and the exercise of sensuality were constant needs, as acute as thirst, as gnawing as hunger.

Once Colette was launched on a writing career by her overbearing, exploiting husband, she could not do otherwise than write her way through the many turmoils that would have blocked a less facile talent:

> It takes up too much time to write. And the trouble is, I am no Balzac! The fragile story I am constructing crumbles away when the tradesman rings, or the shoemaker sends in his bill, when the solicitor, or one's counsel, telephones, or when the theatrical agent summons me to his office for "a social engagement at the house of some people of very good position but not in the habit of paying large fees."

She wonders wistfully how many books she has been deprived of reading and how many lovers she has missed in the interminable hours devoted to her profession. Miraculously she managed to produce some forty volumes, all basically about herself, and conveying through herself the feminine mystique. She was her own most interesting character, and beneath her attempts at fictional delineation of a Claudine, a Lea, a Gigi was Colette's palpitating heart, faintly veiled, disarming in its candid subjectivity.

TO a public more interested in fact than fiction, Colette's type of writing will appear very "modern." Indeed, it was Colette's generation of narcissists, with their accent on self-revelation, that set the style for autobiography. Colette was one of those who held sincerity to be the highest virtue, equating frankness with permissiveness, making of social license a badge of courage and a bid for sympathy. Her success was prodigious. The compulsion to write, which stayed with her to her eightieth birthday, became her salvation and the one constant factor among the upheavals of gaining and losing lovers and friends.

Earthly Paradise is a suitable title for this collection, for Colette's whole life was cadenced by the correspondences she felt in nature: "compelling, fierce, and secret rapport I had with the earth and everything that gushes from its breast." Her joys are reflected in the beauties of gardens, her griefs consoled by her empathy with mute but comprehending animals, her emotional attritions are blamed on the absence of natural beauty in "this great evil, this city life." Nature becomes the rich pool of her metaphors. With each change that comes to her through exterior events the "flavor" of her life changes "as the flavor of wine

—*Photos from the book.*

. . . confronts old age with grace."

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changes according to the slope on which the vine is planted."

In the beginning there was the mother whom she adored, and to whom she wrote a letter every day during her impulsive first marriage, which took her to the slums of Paris; and the father, whom she appreciated too late. Then her disillusionment when she catches her husband in the act of adultery; her separation and solitude; a second marriage culminating in maternity at age forty; a third marriage quickly passed over, and many inbetween loves, among them a "dissolute" young man half her age whom she immortalized in *Chéri*—such is the stuff of her life.

COLETTE swings from deep insight to light gossip with fantastic ease and unabashed disregard for literary proprieties. As adept in one as the other, she will no doubt earn literary permanence through her psychological illuminations, which bring her close at times to Montaigne and Proust, though she is more practical and earthy. With characteristic deftness, she measures the variations of human solitude:

> There are days when solitude, for someone my age, is a heady wine that intoxicates you with freedom, others when it is a bitter tonic, and still others when it is a poison that makes you beat your head against a wall.

Without self-pity she describes the marital metamorphosis of love that starts with curiosity and lasts only as long as the curiosity lasts, leaving a bad aftertaste in the passing. Almost mischievously she compares the cravings for sex and for cigarettes:

> I fear there is not much difference between that habit of obtaining sexual satisfaction and, for instance, the cigarette habit. Smokers, male and female, inject and excuse idleness in their lives every time they light a cigarette.

With the finesse of one who has exercised objective judgment over subjective experience she discusses natural and inverted sexual habits as degrees of shading rather than antitheses. And as she confronts old age, she watches the "undulating ribbon of the road" with grace and humor.

Colette permeates the consciousness of her readers with a style that survives translation simply because, expert as she is in her use of language, the real power of her communication lies more essentially in images so appropriate that verbal modifications do not mar them too much.

Earthly Paradise is a happy addition to Colette in translation.

Rabbis, Angels, and Demons

In My Father's Court, *by Isaac Bashevis Singer, translated from the Yiddish by Channah Kleinerman-Goldstein, Elaine Gottlieb, and Joseph Singer (Farrar, Straus & Giroux. 307 pp. $5.50), a collection of autobiographical sketches, recreates the unique world that informs the author's novels and stories. Albert H. Friedlander's "Anthology of Holocaust Literature" will be published this fall.*

By ALBERT H. FRIEDLANDER

FOR SEVEN generations, going back to that Reb Moshe who was a devotee of the Baal Shem Tov, Isaac Bashevis Singer's ancestors have been Chassidic rabbis. Into their courts thronged the disciples; from their lips came inspired wisdom: "Out of my father's mouth spoke the Torah, and all understood that every word was just." In this memoir, now presented in an excellent English translation, Mr. Singer gives us the foundations of that unique world that opened itself to American awareness through such works as *Short Friday, Gimpel the Fool, The Magician of Lublin,* and *Satan in Goray.* It is a world that no longer exists, described in the nuances of a language spoken less and less; it reaches us through one of the great literary artists of our time, who constantly captures the strange and the demonic in his depictions of the commonplace.

These memoirs of Singer's childhood confirm the grotesquerie of his novels and short stories. Slaughtered geese shriek when they are cooked, salesmen stop by to sell the rabbi eternal life, lovers are divorced and enemies betrothed. The Torah remembers false oaths sworn before it, miracles are affirmed because they have been proven false, and the discussion in the House of Study comes to an anguished halt while a man requests permission to sleep with his dead wife. Nevertheless, it is not the grotesque that stands out as the chief element in the world of Isaac Bashevis Singer, but its moral quality. This is not due to a moralizing approach. Singer does not view the archetype of the Yiddish world, the *"kleine menshele,"* as a heroic or moral figure. He possesses too much irony, too much detachment, too much private knowledge of flawed human beings to indulge that sort of didactic writing. He knows of the terrible hurt that poverty inflicts upon man; he also knows of man's inner qualities which can overcome the world's evil—for a while. In his vignettes these qualities crop out in characters who are always individuals and not paradigms of the Jew or non-Jew. The washerwoman may have "that certain pride and love of labor with which the gentiles have been blessed"; but she also has an absolute quality that can even transform the coins which pass through her washed-out hands into weary, clean, and pious likenesses of herself. Black-bearded dairymen with the voice and heart of lions practice true charity alongside saintly but unworldly rabbis. Mr. Singer, however, does not mourn for them as a type that has been annihilated by the Nazis; he recalls each one as a human being containing a spark of divinity and deserving of his own memorial prayer.

Both skepticism and faith have their place in Singer's writings. His story of a family and a rabbinical court is based upon his conviction that "there can be no justice without godliness, and that the best judgment is one accepted by all litigants with good will and trust in divine power." His earlier chronicles of the demonic and sexual aspects of Jewish mysticism are here balanced by recognition of the ethical and rational strata which scholars like Gershom Scholem and Leo Baeck have stressed as its foundation.

SEEN in its full clarity in "A Major Din Torah," the court is at once in the world and outside it, founded upon that divine authority which reaches through three millennia of Jewish life and finds its voice in the quiet judgments of the rabbi. The judgment may not always be of consuming brilliance. But when the litigants have taken hold of the rabbi's kerchief and have submitted to his decision, a moral dimension enters human existence that cannot be swallowed up by the outer darkness.

This memoir has to be read on a number of levels. On the one hand, it is an autobiographical account that brings us to an understanding of the differences between the brothers Singer. The elder, Israel Joshua prepared the way for the younger when he broke away from the Chassidic tradition and entered the

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world of Yiddish literature through such highly accomplished novels as *The Brothers Ashkenazi* and *Yoshe Kalb*. Isaac Bashevis followed him into that world, different, uncertain, but possessed of a talent that led him beyond his brother into a uniquely personal area containing more of his father's influence than he perhaps realized, and much of his mother's skeptical rationalism, which he freely acknowledged.

Hidden within that story is the private life of a young Chassidic boy who yearns for the wild cows and the green grass beyond the Vistula, far from the narrow streets of Warsaw's slums; who listens avidly to the strange secrets whispered behind the closed doors of his father's court; a boy who loses his past as he surrenders to the outside world of the present, but who preserves his roots; a dreamer who to this day lives in the dreams which he has made his reality. Those dreams became the fiction of Isaac Bashevis Singer; but in this memoir the fiction is validated. Krochmalna Street, Radzymin, and Bilgoray come to be recognized as evocations of a world that truly existed, and which will live as long as we listen to stories. If there are occasional lapses in the spinning of the tale, the total contents of this memoir still make it one of the truly outstanding books in its genre.

Life Without Father

The Diary of Anaïs Nin: 1931-1934, *edited by Gunther Stuhlmann (The Swallow Press and Harcourt, Brace & World. 368 pp. $6.95), covers four years of the journal-keeping novelist's life in Paris during the early 1930s. Leon Edel, biographer and critic, wrote "The Modern Psychological Novel."*

By LEON EDEL

DIARY-KEEPING belongs to a curious and special order of literature; it is the imagination held at bay by the self—the individual so preoccupied with personal experience that he must re-rehearse it compulsively on a sheet of paper. It is inevitably an act of self-absorption; in the process it becomes also an act of self-revelation—in spite of all that it attempts to conceal. Its interest for the reader resides in its offering glimpses into private worlds—worlds to which we do not otherwise have access.

Anaïs Nin's diary, kept with consistency (and almost, one might say, addiction) over many years, is thus primarily a document rather than an act of creation, a record of self-contemplation in many mirrors—public rather than private mirrors. She began keeping it as a child. Her father, the Spanish composer Joaquín Nin, had left her Danish mother, and the latter took her children to America. To fill the absence of the father, the young Anaïs began to write down all that happened to her, in the hope that some day she might show it to him. She wrote her diaries wherever she went, carrying them with her as a musician carries his instrument. Her voluminous notebooks of the self thus fulfill many purposes. They were, for Miss Nin, a way of giving herself concrete proof of her own existence. The diary also became, as it were, her father; and we catch in these pages the straight, questioning look of a little girl interrogating life and trying to be well-behaved and dutiful. But there is something more complicated as well: the diary is that of a daughter, living or imagining a life that would be pleasing to the absent parent.

Anaïs Nin — "self-contemplation in many mirrors."

That life is divided (in the more adult years of 1931 to 1934 here published) between bourgeois respectability and a kind of anarchistic Bohemia. Miss Nin lived on the edge of Paris, at Louveciennes in the *paysages* exquisitely preserved for us by Pissaro's canvasses. To her orderly home came the literary anarchists of the Depression era, and especially Henry Miller. Thus we have in these pages the double image of an intellectual bluestocking who can also be a haunter of bistros and visitor of brothels. Miss Nin was disciplined, logical, a *"petite fille littéraire,"* as one called her, meticulous in thought and dainty in word, self-questioning, busy discovering for herself the discovered world. When she is reflective and philosophical, she is an earnest, papa-pleasing little girl; when she looks up from the pages of her writing, she sees the world as a sensitive observer; when she allows herself to feel rather than reflect, her pages take on the color of life rather than of literature. To the critical reader, seeking a self-portrait between these lines, Miss Nin appears above all as a troubled pre-adolescent pursuing a dream of reuniting her parents and recovering her father; and this is why so much of this journal is devoted to her attempts to make peace between substitute figures, Henry Miller and his estranged wife.

The present excerpts are important above all for the subjective, and probably refracted, "portraits" of Miss Nin's psychoanalysts. Readers will be particularly interested in her account of her analytic sessions with Otto Rank, Freud's brilliant if erratic disciple. Through the blur of Miss Nin we glimpse Rank expertly unveiling to her the defenses she has created in her life by her diary-keeping, not least the ways in which the diaries prevent her from developing as an artist by making her an annotator rather than a creator. Miss Nin gives the impression that she conducted the sessions as if she were the analyst. By her account both her French analyst, René Allendy, and the Viennese Rank become fathers and lovers; the symbolic house of incest (the title of her first novel) is recurrently revived.

Henry Miller, with understandable partiality and consistent exuberance, has described Miss Nin's diaries as destined to take their place beside the confessions of St. Augustine, Petronius, Abelard, Rousseau, and Proust. Whether this is true of the millions of unpublished words we cannot say; but the present "sampling" offers a modulated and low-pitched portrait of the early Depression years in Paris after most American expatriates had fled. The myth of D. H. Lawrence prevailed; and life in the Villa Seurat had not yet become the Miller-Durrell legend. Miss Nin is a child of the Lawrentian revolt and of the Surrealists, that phase of the movement which looked inwardly into the distortions of the dream. Literary history will probably place her with that last backwater of Romanticism before World War II.

Her diary contributes much to that history, and one hopes for more of the 150 volumes. But they should be quarried, it might be suggested, with caution, lest they become like Frankenstein monsters, too large for Miss Nin's own childlike, lotus-flower essence.

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Failure of the Great Leap Forward

The Politics of the Chinese Red Army, *edited by J. Chester Cheng, translated from the Chinese by Mr. Cheng and others (Hoover Institution. 776 pp. $35), containing secret military journals for the period November 1960-August 1961, affords behind-the-scenes glimpses of the disastrous results of Mao's "Great Leap Forward." Welles Hangen, Press Fellow at the Council on Foreign Relations, was formerly NBC News correspondent in India, Germany and the Middle East.*

By WELLES HANGEN

"AT THE time of my discharge, I shall not want anything but a rifle," Liu Sheng-hua, a deputy squad leader in the Red Chinese army, told his men at target practice in September 1960.

"Why a rifle?" one of them asked.

"To fight the Party!" came the reply.

Liu's bitter remark, prompted by the ravages of hunger among his peasant family in the wake of the Great Leap Forward, is one of many evidences of disaffection in the People's Liberation Army disclosed in these secret Chinese Communist military journals for the period from November 1960 to August 1961.

Although the State Department released the original twenty-nine journals to scholars in 1963, the present translation issued by the Hoover Institution on War, Revolution and Peace at Stanford University, is the first effort to make this treasure house of source material on Communist China available to a wider public. Professor J. Chester Cheng of San Francisco State College and his six fellow-translators have labored hard to make sense out of the turgid prose of the Chinese army's General Political Department; but this massive compilation remains a work for the specialist, not the general reader. In view of the recent upsurge of interest in Communist China and the torrent of largely uninformed discussion about that country, this is unfortunate. An annotated and edited digest of the military journals would make fascinating reading for anyone interested in the shape of China today.

For those willing to wade through 759 pages of Communist rhetoric, the journals, or "Work Correspondence," as some authorities prefer to call them, give a gripping picture of the convulsions caused, at least in part, by Peking's disastrous Great Leap. They speak of insurrections in Honan province and other parts of the country, of "counter-revolutionaries" seizing power in some localities, of "famine," "mass starvation," and outrages against the peasantry by militia "gangsters." But most of the time there seems to have been no need to amplify the journals' Orwellian references to "the disaster." Troops were told to eat refined rice straw instead of poisonous wild plants, and to refrain from handshaking to halt the spread of infectious disease among Mao's hungry legions during the winter of 1960-61. While army units were put through an elaborate campaign of "remembrances of hardships" under the old régime, edema,

dropsy, and other effects of malnutrition took an ever-increasing toll. When famished members of soldiers' families appeared at military bases, Communist party cadres were told not to turn them away but to offer them a drink of "hot water" in lieu of more substantial hospitality.

The "temporary difficulties," as the military papers call the economic collapse of 1960-61, may now have been largely overcome; but the lack of revolutionary zeal among younger Party cadres that so worried the Chinese leaders then has not been remedied, judging from the concern expressed on this score by the Chinese Communist press today. The journals tell a story of generations in collision: the aging and doctrinaire veterans of the Party's struggle for power, seeking to remold China's masses in their own egalitarian image, and bent on putting politics in command in the mess hall and on the battlefield, versus the younger cadres, who find comfort in status and technology rather than in appeals to human will. The journals disclose that, along with the idolatry of Mao Tse-tung, the Chinese army practices the subcult of its defense minister, Marshal Lin Piao, author of the now famous treatise on "people's war," who is quoted as saying: "The situation in China permits only a Party with guns in hand." There are frequent references in the journals to "the thought" of Chief Lin, a phrase usually reserved in Communist China for Chairman Mao. The thought of Mao and his defense minister, as reflected in these documents, appears to take little account of offensive military operations beyond China's borders. The emphasis is on dispersal of production facilities, guerrilla tactics, and other defensive measures designed, in Marshal Lin's words, to "engulf the enemy in the boundless ocean of people's war."

The portions of the journals devoted to foreign policy have a sober, almost defensive quality, lacking in discussion of domestic affairs. The United States is pictured as the chief enemy, but a general settlement "all at once" is not ruled out. Peking considered Africa its best bet in 1960-61, but cautioned its officers that "No immediate results should be expected." The Chinese would presumably be even more reserved in their assessment of Africa today.

The journals eschew direct attacks on the Soviet Union—possibly a reflection of Peking's hope of preventing a complete break at that time. There is one reference to the need for securing China's Northwestern frontier; and it is disclosed that as early as July 1958 Mao told China's military to get rid of its Soviet military manuals. But in 1961 the Chinese Communists were still calling for solidarity with Russia. A "flood of revisionism" was sweeping China, according to these papers.

What the Communists are fond of calling the "red thread" running through all these documents is well expressed in a resolution passed by the Party's Affairs Commission in the fall of 1960, and published in the journal of January 7, 1961:

> History has shown that mighty enemies and powerful weapons are not always to be dreaded; what is really to be dreaded is political corruption, departure from the masses of the people, ideological disarmament, and laxity and even loss of the will to fight.

And, the journals add later on, the fear of ghosts. Many Chinese soldiers are still unwilling to go near graveyards. As Chairman Mao has said, contradictions remain.

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Man's Place in the Landscape

Death in Midsummer and Other Stories, *by Yukio Mishima, translated from the Japanese by Edward Seidensticker, Donald Keene, Ivan Morris, and Geoffrey Sargent (New Directions. 181 pp. Hardbound, $5.50. Paperback, $2.25), reveals new dimensions of insight and sensibility in the Japanese novelist and playwright. Howard Hibbett, professor of Japanese literature at Harvard, translated Junichiro Tanizaki's "Diary of a Mad Old Man."*

By HOWARD HIBBETT

MOST Japanese "novelists" (*shosetsuka*) are in fact primarily writers of short stories, sketches, vaguely fictionalized essays, all of which are indiscriminately called *shosetsu*. Not surprisingly, in view of the age-old ascendancy of minute poetic forms in Japan, brevity has never been considered incompatible with the highest artistic value, and one often finds that "novels" which are acclaimed as masterpieces turn out, on inspection, to be stories or sketches of a few pages in length. Such works are particularly tempting to the translator but editors and publishers have seldom shown much interest in them. It is therefore more than ever gratifying to welcome this fine collection of stories, with a play for good measure, by the internationally well-known novelist and dramatist Yukio Mishima.

Paradoxically, perhaps, the title story, "Death in Midsummer," is at once the longest and the most moving. Two small children and their aunt, who suffers a heart attack, drown in the shallows off a lovely, unspoiled beach (discreetly identified as A) near the southern tip of the Izu Peninsula. Summer is at its blazing height, the setting is idyllic, and, though there is "anger in the rays of the sun," even the cruelty of the sea is masked by its scintillating beauty. Summed up in an epigraph from Baudelaire (*"La mort . . . nous affecte plus profondément sous le regne pompeux de l'été*) and exquisitely illustrated in Japanese literature for more than a millennium, death in such a setting takes on a poignant irony.

But Mishima goes on to the aftermath: the customs that must be followed, the requirements of society, the private, irrational fluctuations of grief, and the old intrusive, unseemly emotions of irritation, resentment, jealousy. Tomoko and Masaru are a conventional young couple, with a conventional inability to face the reality of their true feelings. Masaru reacts by retreating into his work, by drinking late in the evenings, by allowing himself a trivial infidelity out of dissatisfaction with his failure to match his wife's sorrow. Yet even Tomoko finds forgetfulness stealing over her, distressingly improper as that seems, and life predictably asserts itself. "The outlines of the incident were slowly giving way, dimming, blurring, weathering, disintegrating." Still, her experience has been one that her husband could not share; she remains more vulnerable to the cruelty of the sea and the blinding midsummer sun.

In this simple but profound and beautifully finished story, more vividly than in even such ambitious novels as *After the Banquet* or *The Temple of the Golden Pavilion,* Mishima has succeeded in investing an "incident" with imaginative life. Psychological analysis in the classic French tradition is enhanced by awareness of the changing seasons, by a sensibility fusing passions, meditations, and landscapes in the great tradition of Japanese literature. Elsewhere in his work the incident sometimes remains stubbornly unrealized, richly detailed yet as remote from poetic truth as a bald newspaper account or a dry medieval chronicle.

The theater, however, has always stirred Mishima's imagination, and two of the finest pieces in the book are "Dojoji"—a Noh play as brilliant as any of his earlier *Five Modern Noh Plays*—and "Onnagata," a masterly study of emotional currents set up behind the scenes at the Kabuki by Mangiku, an aloof, seductive performer of feminine roles whose feelings offstage are as theatrical as his flamboyant entrances and exits. An admirer sits in his dressing room awaiting him—"The mirror suddenly burst into crimson flames as Mangiku returned to the room, filling the entrance with the rustle of his robes"—or sees him leave, under an umbrella with a surly young director, in a delicious parody of the exit of star-crossed lovers. Both as an evocation of the Kabuki magic and a study in involved emotions, the story shows Mishima at the height of his powers.

Notable among a number of other striking stories in this collection are "The Priest of Shiga Temple and His Love," an elaborately embellished version of an old tale about the conflict between sacred and profane love, and "Patriotism," a romantically exalted but gruesomely realistic account of the ceremonial suicide of a young army lieutenant and his wife. Sometimes the embellishments seem too elaborate, the incidents too obviously contrived into the semblance of a deeper significance. But there is no question of Mishima's versatility and lively talent; nor, thanks to the flawless translations of Edward Seidensticker, Donald Keene, Ivan Morris, and Geoffrey Sargent, is there any doubt of his virtuosity as a stylist.

"It was hard enough to stomach the news in black and white let alone in color."

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The Crime of Not Caring

A Sentence of Life, *by Julian Gloag (Simon & Schuster. 380 pp. $5.95), explores the ethical dilemma of a modern innocent charged with murder whose real crime is indifference to his fellows. Joseph Haas is an editor and staff writer for Panorama Magazine of the Chicago Daily News.*

By JOSEPH HAAS

IN HIS first novel, *Our Mother's House,* Julian Gloag took on the task of exposing the true face of childhood, and his achievement was compared favorably with *Lord of the Flies* and *A High Wind in Jamaica.* With *A Sentence of Life* he has set himself an even more difficult goal, the dramatization in terms of a man of our time of Pilate's crime—the refusal to accept responsibility.

This ethical dilemma is explored within the framework of a suspenseful murder case and taut trial scenes. Yet, admirably as these are managed, they never overshadow the theme of the crime of indifference. The murder case is essential only as the catalyst that forces Jordan Maddox to come to terms with himself.

Maddox is an upper-class Englishman of proper emotions and manners whose life is of such soothing order that he might have lived its entirety without having to acknowledge its quiet desperation. He has a lovely wife, a loving small daughter, few but comfortable friendships, an undemanding position with his uncle's staid publishing house. When a friend who amuses him suddenly drops his facetious manner to confess to the "aimless lust or agonized emptiness" of his life, Maddox is embarrassed because he can offer no "answering terror of his own." He has placed himself beyond such vulnerability by refusing to accept the responsibilities of meaningful relationships with others.

Then a young, unmarried secretary from his office is found strangled in her apartment, and an autopsy shows that she had been two months pregnant. Maddox is routinely questioned and professes his innocence, of course; everyone who knows him would consider any other possibility a poor joke: old Jordan would never complicate his life that way. But, bit by bit, inconsistencies in his statements and circumstantial evidence amass against him, and he is charged with murder.

At first, Maddox accepts eagerly the isolation of his cell; it is his ultimate detachment from life. But the ordeal of the courtroom is nothing compared with the trial of his solitude and of the memories that flock to give evidence against him. The world will not permit him to plead *nolo contendere.* In the past he had been the "perpetual lamb, shorn and sad-eyed" because it was "much easier to be the innocent, to allow others to take the responsibility for what you become." Now he is denied that comfort of self-pity.

People had stretched out their hands to him, in need, for love, friendship, comfort, understanding, but he had not responded to them. And so he drove his wife to her private shame, failed his daughter, and, most terrible of all, denied solace to his pathetic Uncle John, the old soldier who had fought a good war and returned from it to deteriorate among toy soldiers, dreams of past martial glories, and a secret weakness for children. They sinned, too, but out of a necessity to act; his sin was that of omission through indifference.

Finally he must concede that "If you—all of you—are not guilty, then I am guilty." But he is denied even the comfort of selecting which crime he shall be guilty of.

Although Maddox is a totally realized, memorable man, he is only the crown of Mr. Gloag's accomplishment. With an enviable exercise of the writer's tools, the author limns a dozen characters, major and minor, in moving, significant dimensions.

And all of it is directed toward the slow revelation of Maddox's soiled innocence. The conclusion—and to reveal more of the tension of the plot would do a disservice to the reader—holds up a mirror that Mr. Gloag will not permit us to ignore.

Growing Up in Paris

Alberta Alone, *by Cora Sandel, translated from the Norwegian by Elizabeth Rokkan (Orion. 762 pp. $7.95), a trilogy, pictures its heroine as a shy, awkward, small-town girl, as a young woman living among artists in prewar Paris, and finally as a mature human being. Dorrie Pagones studied comparative literature in Europe under a Fulbright grant.*

By DORRIE PAGONES

IF A reviewer writes that a novel is "a near masterpiece" or "almost a great book," that novel goes unread. So I shall say without qualm that Cora Sandel's *Alberta Alone* is a masterpiece.

I had never heard of Miss Sandel. In Norway, where she grew up, and in Sweden, where she now lives, the eighty-six-year-old author may be, and I hope she is, as celebrated as the late Somerset Maugham (with whose *Of Human Bondage* it is impossible not to compare *Alberta Alone*).

The work is a trilogy, the first part of which appeared in 1926, eleven years after *Of Human Bondage.* Like Philip Carey, Alberta dreams and idles through a dreary childhood, the victim of acute shyness and small-town Good People. Then, like a revelation, comes prewar Paris and the brief years of freedom, art and love, no money, and infinite possibilities. Finally, with the end of youth there is the inevitable destruction of its hopes and, possibly, the beginning of a new kind of freedom for Alberta, the hard freedom to accept the limits as well as the powers of her own nature.

As a writer, Miss Sandel is Maugham's superior. She has not his gift of irony, but her emotional depth is far greater. Where he remains a worldly observer of life, she is always an actor. Yet she achieves a detachment wholly without cynicism. She must have begun like Alberta, in the early Paris days:

> To plunge into it. To drift, wander about, watch, absorb it all, with no other purpose . . . penetrate unknown territory, buy fruit from carts and eat it sitting on benches, hear the clock strike in different ways in different church towers and know that it didn't matter, no one knew where she was, no one knew where she belonged.

If the book has a fault, it is in being a little too unhurried in its wanderings. Miss Sandel is a stylist, a writer of marvelous delicacy; and the standard trouble with beautiful writers is that not enough happens in their books. Alberta merely exists in Norway, only begins to live in Paris, has a child by a painter, tries sometimes to write. Nothing more.

At first one is disconcerted, for the

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novel does not immediately grip the imagination but slowly grows upon it, like the landscape seen from a train:

> A landscape without distinction which one passes on a journey and immediately forgets; and wonders where it came from when one day it reappears in the memory, more distinct than any of those looked at more carefully. Meadow, wood, air and water: these life-giving four.

That sounds terribly writerish here, but in the context it doesn't. Anyway, that is what happens.

Alberta Alone is not one of the very great novels—the kind that change you and become part of you forever—but it is one of those that make you remember certain things you thought you had forgotten. To read it is, in part, to relive the painful experience of growing human.

And apparently that process has not changed much in the last half-century or so.

Professor's Pajama Games

The Doctor Is Sick, *by Anthony Burgess (Norton. 260 pp. $4.50), recounts the impact of lowlife on a contentedly ossifying professor of linguistics. Elinor Baumbach is a free-lance writer and critic.*

By ELINOR BAUMBACH

AS ANTHONY BURGESS's reputation grows in this country, his publishers push ahead with the publication of his entire canon. In the past few months we have had the early *A Vision of Battlements,* the excursion into criticism *Re Joyce,* and now *The Doctor Is Sick,* a witty study of an ossifying professor of linguistics whose life has become defined by the dogma of language and whose emotional decay is reinforced by the growth of a brain tumor which, as the book opens, requires immediate treatment.

Dr. Edwin Spindrift has been bumbling contentedly along, immersed in his consonant blends and comparative dialects. His lack of sexual appetite seems a distasteful but irrelevant fact, although he is unhappy about his uninvolvement in the implications of his wife's adulteries. When a sudden fainting spell brings him to a doctor, he is more irritated than dismayed. Whose life finally could be more rational than his?

However, from the moment Edwin finds himself enmeshed in the terrible efficiency of a London hospital, his world begins to crack, erupt, convulse into the sort of horrific comic vision which Burgess handles with consummate skill.

Unfortunately, in this case the vision ultimately fails. It is black enough to suit our time, and certainly funny; but Spindrift does not have sufficient weight. His predicament behind the comic situation is not serious enough. Céline once said that futility is the intellectual's vice. Convinced as we are of Edwin Spindrift's futility, we need more than grotesqueness to persuade us of his redemption.

But what Burgess does well, he does very well indeed. Refusing to accept the fact of his illness, Edwin, repelled by the grim cheer of the hospital technicians, who are extensions of the machines they operate, distracted by his wife's disappearance with her newest lover, decides to escape. With wrinkled pajamas and freshly-shaved skull he descends into the surreal bar which is his wife's last forwarding address. When his baldness is discovered by the Dickensian characters who frequent the illegal establishment he becomes a minor celebrity. In a brilliant series of Keystone capers, which flash before us like scenes from the new cinema, Edwin spins from the clutches of the Stone Brothers' show-biz ambitions for him as a contest winner ("Undred nicker an' a film-test. Fink of what vat means to you, only a poor bleedin' perfesser."), into the arms of Bob Courage, a mad-eyed mobster who has developed a yen for what he guesses to be Edwin's special perversions. He bobs in and out of the hands of the law and finally, in best farcical manner, opens a wrong door innocently to find his wife in bed with a perfect stranger.

THE book is punctuated by memorably amusing scenes: Edwin lecturing on semantics to row upon row of prostitutes and pimps; the climax of a chase when Edwin, crowned the "Bald Adonis of Greater London" in a humiliating circus of flesh, spits an obscene word into the television microphone before being leapt upon by all his pursuers.

Throughout Edwin's travels there have recurred commercials for a new cleaning device, the "Spindrift." This joke is emblematic of a deeper flaw in the book as a whole. Its milieu throughout is a shade more picturesque than exacerbating—a failure, it would seem, of Burgess's generally mordant intention. When Edwin emits his four-letter expletive, the word is described, not quoted. This sort of evasion might produce comedy, but not the Swiftian revelation that has become a Burgess trademark.

Mechanized Caesar: The opening pages of *Gascoyne* (Putnam, $4.95), Stanley Crawford's first novel, read like a wild parody of the hard-boiled detective story. Receiving a tip that Rufus Roughah, "prominent citizen and big crook," has just been shot, Gascoyne visits the Roughah estate, where an extraordinary amount of action goes on, including an exquisite interrogation by Gascoyne of Roughah's young widow.

It soon develops, however, that Gascoyne is very much more than a private eye. A thoroughly mechanized man, he literally lives in his car, which is equipped with a telephone and various other appurtenances. He has reduced his animal needs to a minimum, subsisting on two candy bars a day and half an hour's sleep. There is a girl, "good old Marge," in his life, though her status is uncertain; but Gascoyne's interest in sex is largely confined to its potentialities for blackmail. For more than ten years he has ruled his unnamed city, which appears to be in California: he has erected housing developments for all sorts and conditions of men (including what is probably the world's only prefabricated slum), and provided them with a chain of supermarkets. He owns the used-car lot, the demolition company, the newspapers, the funeral home, and the police commissioner. Gascoyne also holds under government contract the top-secret zoological warfare station, where security precautions are so awesome that upon the entrance of visitors the typists zip themselves, desks and all, into large plastic hoods labeled "Shhhh!"

When Police Commissioner O'Mallollolly insists on calling Roughah's death a suicide, and absconds with both the corpse and the murder weapon, Gascoyne smells treachery within his empire, and things proceed rapidly from bad to horrendous, culminating in the epic Battle of the Police Tower and a subsequent saturnalia in the Celeste Gascoyne Maternal Memorial Auditorium. To divulge any more would be unfair to Mr. Crawford's unbridled imagination.

Gascoyne's first-person narration, deadpan if grammatically uninhibited, adds a dimension to the preposterous goings-on, until one wonders uneasily just how exaggerated they really are. This is an uproarious book, but the fun does not obscure the chilling reality that inspired it. —RUTH L. BROWN.

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The Tammany Side of the Story

Behind Closed Doors: Politics in the Public Interest, *by Edward N. Costikyan (Harcourt, Brace & World. 369 pp. $6.95), explains the nature of modern urban politics. William D. Ogdon is a member of The New York Times editorial board.*

By WILLIAM D. OGDON

EDWARD N. COSTIKYAN pleads guilty to being the first leader of Tammany Hall to write a book. Some Tammany bosses of the more distant past may never have read one. But Mr. Costikyan is of the new breed of city politician—literate, and even fastidious in his tastes, a musician in his spare time, and a lawyer by profession.

Politics is not a life career with him; he moves in and out of it at will. Although in politics for nearly fifteen years, his tenure as New York County Democratic chairman (succeeding Carmine G. DeSapio) lasted only thirty-two months, ending in November 1964. He departed in what was reported at the time to be a disagreement with the then Mayor Robert F. Wagner over patronage and political support from City Hall.

Within a few months, however, he was back in political harness, managing the successful Democratic primary campaign for mayor by Abraham D. Beame, who defeated the Wagner protégé, Paul R. Screvane. His credentials as a campaign manager and a political prophet were impaired on election day in November. John V. Lindsay was elected mayor, in spite of Costikyan's election-eve forecast that Beame would win by well over 100,000 votes.

Behind Closed Doors is a misleading title if it encourages the reader to expect scandalous disclosures about what goes on in smoke-filled rooms of New York political clubhouses. For, as Edward Costikyan warns, this is not a "kiss-and-tell" book.

It is really several books. It is an adult primer of how to get out the vote, and swing it your way if possible, through the awful drudgery of pushing doorbells and trying to get into New York apartments. It is a book that tells how the district captain builds his strength, how he scrounges for money to pay legitimate expenses. It is a debunking book, laying to rest the "myths" that aspirant money often buys nomination to public office, including judgeships; that delegates to state party conventions have any individual autonomy of their own; that Bar Association endorsements of candidates for judgeships are the final and uncontestable distillation of impartial, holy wisdom, and that political chairmen have sinister and almost unlimited power over government.

MR. COSTIKYAN is a strong believer in the political party as an agent for "good government," and mourns the decline of its influence. He is a middle-roader in the "reform" movement in New York Democratic politics, a former law partner and devoted admirer of the late Adlai E. Stevenson. He was the man chosen by Wagner to succeed Mr. DeSapio as Tammany boss, whom he describes as a man "obsessed" by ego. Wagner he believes to be a "political genius."

But he is level-headed about the "reformers," noting their almost unanimous interest in patronage on their way to "regularity." And although Costikyan ran a clean shop as Tammany leader, he retained some of the standards hallowed in the past.

He defends the racial and religious "balancing" of tickets as a sound manifestation of democracy. He is somewhat ungenerous to the Liberal Party, which he says has become a tail for someone else's kite. Costikyan doesn't say so, but this conviction was probably confirmed when the Liberal Party abandoned the Democratic Party for once and went with Lindsay. He apparently sees nothing wrong with offering a government job to a man as a "sensible solution" to avoid a primary fight. But he was willing to battle to the bitter end to keep a candidate with "an honest-to-God police record" off the ballot.

He explains the wariness of political leaders in accepting a "newcomer" as a candidate for public office; they are uneasy, not knowing what heinous blunder these neophytes may commit on the stump. The leaders feel more comfortable, and confident, with candidates they have seen around the clubhouses and worked with while pounding the pavements.

Although he defends national political conventions, Costikyan takes a dim view of the state nominating process in

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New York. The mistakes of a state convention "take about three years to clear up." Representing a "disoriented collection of separate fiefdoms," a state convention is more subject to "deals." The delegate is "the property of his leader." Costikyan doubts that Charles Buckley, the old-line Bronx Democratic boss, ever polled his delegates. He knew how they ought to vote, and he voted them.

Mr. Costikyan wants the public to re-evaluate politicians, and stop thinking of them as thieves. He laments the passing of "boss" power to those who preside in public office, and points to the dangers that come of the increasing supremacy of civil service unions. Although Mr. Costikyan holds the press in rather low esteem, apparently he condones "use" of the press, by politicians, for political purposes.

In general, however, Mr. Costikyan takes the high road of politics, rather than the low. In view of the dearth, in recent years, of able, informed books about the fascinating scene of New York politics, it is cause for regret that this book does not bring us more candid and ample disclosure of what does go on "behind closed doors" and a better insight into the chief characters who have crossed the stage in Edward Costikyan's time.

If he, with his vast opportunity to observe, had told us what he really thought of Wagner, Robert Kennedy, Beame, Adam Clayton Powell, DeSapio, Charles Buckley, Stanley Steingut of Brooklyn, Averell Harriman, Nelson Rockefeller, Frank Hogan, and of the king-making intrigues, as well as the campaigns of recent years, this could have been an excitingly interesting book instead of a constructively didactic but somewhat dull one. The author then could have brought more persuasiveness to his diagnosis of politics an an "addiction."

BUT even if Mr. Costikyan, as the gentleman in politics, has made no adversary mad, he has delivered with conviction the earnest truth that until people—good people—rid themselves of the notion that politics at the ward and district level is somehow not quite respectable, they will be condemned to live with the consequences. If they will not enroll in a party of their choice, get into the clubhouses, work at the level where nomination to party and public office has its genesis, and run for office themselves, they cannot complain when mediocrity is all they have to vote for as November comes around.

Mr. Costikyan is a great believer in the power of priorities properly evaluated and executed. He is trying to tell us that representative, democratized politics is the first priority on the way to better government, in New York and everywhere else.

A Political Triumph Over Racism

***Southerner,** by Charles Longstreet Weltner (Lippincott. 188 pp. $3.95), predicts that the extreme racist element of the Democratic Party will be absorbed into the GOP. Bruce Galphin is an editorial writer and columnist for the Atlanta Constitution in Georgia.*

By BRUCE GALPHIN

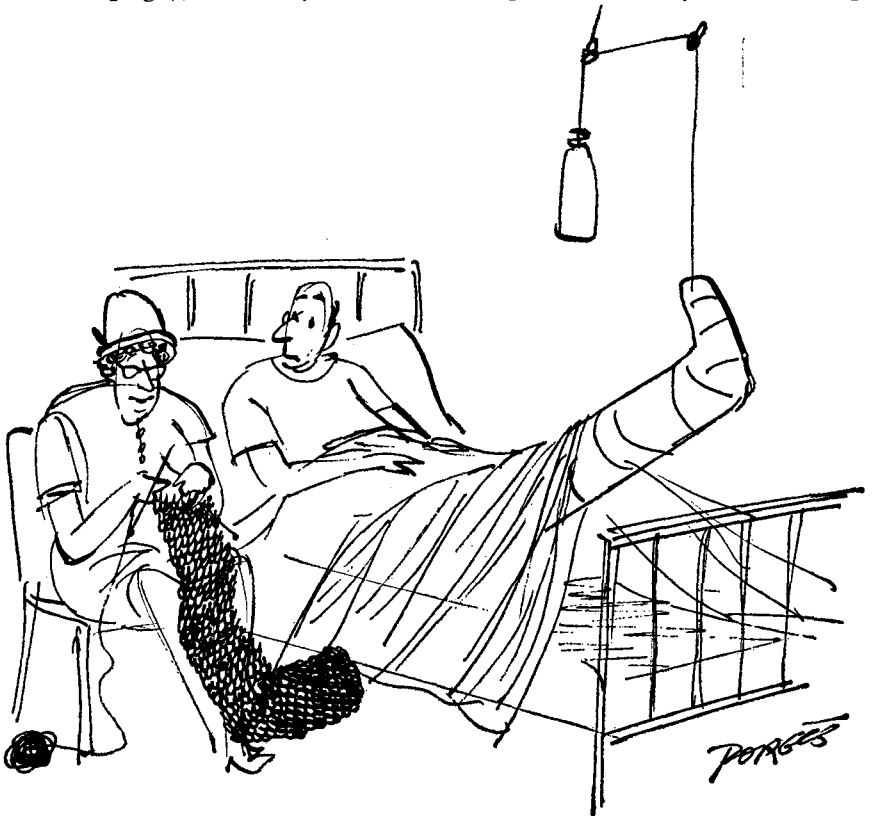
THE MOST remarkable thing about this book is its author. It is personal reminiscence, but many have reminisced with more memorable style. It is race relations history, but the material and the insights have been explored before. It is a Southern white man's appeal for racial justice, but this cause has been pleaded eloquently by others.

What makes *Southerner* remarkable is that the author who writes with such openness, scholarship, and racial liberalism is congressman from the Fifth District of Georgia. Charles Longstreet Weltner is completing his second term in the House of Representatives. In 1962 he overcame obscurity, lack of financial backing (he's still paying a note on that campaign), immaturity, and the vote-diluting county unit system to defeat a well-entrenched segregationist who had one of the most obstructionist records on Capitol Hill.

In Washington Mr. Weltner has voted slightly left of center, disappointing the purist liberals occasionally on matters of economics and labor. He quickly mastered the intricacies of the bureaucracy and thereby has become so effective in obtaining appropriations for his district that he has won considerable admiration and support within the Atlanta power structure that once opposed him. He proposed and served as a member of the committee investigation of the Ku Klux Klan.

But by far the most interesting political fact about Representative Weltner is that he voted for the Civil Rights Act of 1964—and was handily re-elected later that year. His survival is strong documentation of the Southern political ferment to which he addresses himself in this volume.

Race lies at the center of any understanding of the South, and it is the core of *Southerner*. ". . . the burden of Southern history," Mr. Weltner writes, "is lost opportunity." He traces the failure of racial solutions from the arrival of slaves in Virginia—the same year the first rep-



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resentative government was established on the American continent—through the Constitutional Convention, Civil War, Reconstruction, Populist era, and the New Deal. Throughout, the Negro was "rarely regarded by either side as a fellow human being," but rather as an agricultural unit, a question for union or disunion, an easily obtained vote.

That is changing now, the congressman believes. The Supreme Court's 1954 school decision and subsequent civil rights efforts have humanized the problem and drawn attention to the moral issues involved. If the continued antics of Southern governors and midnight riders cast doubt on his optimism, election of men like Mr. Weltner help to give it validity.

He does not place all the blame on the South for its current anguish over race relations. Nevertheless, wherever the blame, the result is what Mr. Weltner calls "the Southern gap"—the serious lag behind the rest of the nation on almost any educational or economic index. "The South is poor because the Negro is poor."

Here the author pleads his political case with quiet eloquence. The federal government, he argues, is the most efficient tool for closing the gap, and the Democratic Party its best administrator. He finds it passing strange that Southerners should reject either.

He concedes, though, that the growth of the Republican Party is one of the two most significant developments in Southern politics today. He expects the GOP to absorb the extreme racist element from the Democrats, while what remains of the Democrats will move closer to the national party. Thus there will be one Democratic Party, and the Republicans will be split into Southern and national wings.

THE other major Southern political trend is the expansion of the Negro electorate. It will vote *en bloc,* Congressman Weltner predicts, only so long as it is threatened. Where the Negro vote is large, racism will be dampened.

Southerner is direct, lucid, wryly humorous, and honest. Mr. Weltner does not gloss over the embarrassing. He confesses that his early public defense of racial justice was based on legalisms rather than the more important moral issues involved. He plainly sets forth the chronology of his change from nay to yea on the Civil Rights Bill; the switch occurred, as his critics delight to recall, after court-ordered redistricting shrank his home base to a more liberal, more heavily Negro constituency.

For those not familiar with the demise of Georgia's county unit system, its reapportionment, and the collapse of massive resistance, this book offers an added bonus. But it is above all the document of a man who in turn is the symbol of an encouraging political revolution.

"There's a terrific sunset. Put on your mosquito netting and come on out."

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Monticello and After

The Shackles of Power: Three Jeffersonian Decades, *by John Dos Passos (Doubleday. 426 pp. $6.95), sees thirty years in early American history through the personalities that shaped it. Harry Hansen, a member of the Society of American Historians, has been editor of the World Almanac since 1948.*

By HARRY HANSEN

JOHN DOS PASSOS's latest exploration in the tangled political jungle of the young Republic, *The Shackles of Power*, results in a report of what he calls the "three Jeffersonian decades." The survey begins with January 1807, when Jefferson is trying to dispose of the issues that have plagued him while President before retiring to Monticello: the need to acquire the Floridas, to stop British harassment of American shipping, and to check the conspiracies of Aaron Burr and the New England Federalists. It continues through the Administrations of Madison and Monroe into that of John Quincy Adams, when the spirit of Jeffersonian democracy still carried weight in the counsels of the nation.

Mr. Dos Passos long has been an interpreter of Jefferson, and the title of one of his books, *The Head and Heart of Thomas Jefferson*, shows that he recognizes something besides brain power in the great Virginian. In his new work he weaves his knowledge of Jefferson's personal concerns together with acts of historic importance in a running narrative, so that the happenings of 160 years ago read like the daily reports in newspapers, a continuous account of a man dealing with the incidents of his day. This does not imply that Mr. Dos Passos overworks the use of personal detail; rather, he shows that a human being at the head of a state is still a human being; that Jefferson, suffering from interminable headaches and complaining of "the daily drudgeries of my duty," was able at the same time to deal objectively with the Embargo Act and the threat of war.

While Jefferson's acts and ideas are the main concern of this book, both the President's associates and his enemies are portrayed with equal attention to their qualities and failings. Mr. Dos Passos is not neutral; he is on Jefferson's side. In a long biographical account he stresses the evil influence of Burr; he appreciates the various Adamses, but warns against their bias, and he gives a just estimate of Gallatin's services. Madison was so closely associated with Jefferson that at times their conferences in Monticello practically made that the capitol of the United States.

The shackles of power fall from Jefferson's shoulders to those of Madison quite early in the book, but although Jefferson can "retire" and count his artichokes and asparagus shoots, look after his family circle, and adapt classical architecture to Virginia's needs, he remains at the call of his associates and his influence persists. Mr. Dos Passos has a subject that gives him full opportunity to disclose the sacred and the profane, to move from diplomacy and partisan politics to husbandry, public schools, higher education, plans for getting rid of slavery, and a dozen other topics. He has even investigated the gossip that proved "irresistible" to Jefferson's contemporaries – that of "Dusky Sal," or Sally Heming, reputed to be Jefferson's mulatto mistress and mother of a brood that resembled him. Jefferson never mentioned the subject, and the best explanation seemed to be that Peter Carr, one of his nephews, was the culprit.

This book is a history of three decades seen with the help of personalities. Inside that frame Mr. Dos Passos accounts for the War of 1812, the battles with the Indians, the troubles of the United States Bank, the centralizing decisions of Chief Justice John Marshall, a cousin whose views alienated Jefferson; the origins of the Monroe Doctrine, the Treaty of Ghent, Castlereagh's diplomatic career, Napoleon's retreat from Moscow—by way of Joel Barlow—and the observations on democracy by the inquisitive foreigner Tocqueville. Mr. Dos Passos's writing moves along rapidly, but his fluency is disarming, for actually he has done a great deal of patient research and consulted original papers in many collections for this volume.

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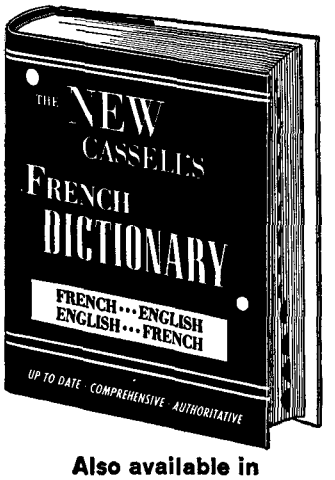

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French Nostalgia and Fun

GEORGES FRANJU is a middle-aged French director whose films are a maddening mixture, all too often, of brilliantly stylistic effects and pedestrian realism. This was evident in his uneven but nevertheless memorable *Thomas, the Imposter,* which was shown at the 1965 New York Film Festival. *Judex,* made earlier and just now released here to coincide with a supposedly widespread wave of interest in ancient movie serials and comic strip take-offs, further reveals Franju's strengths and shortcomings.

Compounded of admiration and nostalgia for the *Fantomas,* the *Vampires,* and the *Judex* serials of Louis Feuillade, who flourished during a period roughly coinciding with the years of World War I, the Franju *Judex* attempts to blend archaic fantasy—a la Feuillade—with a more modern and subdued film technique. The blend is not really satisfactory, and yet the film is uncommonly interesting.

Judex, the arch-hero, is a champion of what might be called arbitrary justice; he wears various disguises, but when on the job or in pursuit he is garbed in black. Even though the setting is France in 1914, he already has invented a kind of closed-circuit television. He has, in addition, the powers of a conventional magician—indeed, the part is played by a performing magician, Channing Pollock.

The arch-enemy in Franju's evocation of the old serials is a beautiful young woman (Francine Berge), who is capable of the most extreme flights of evil and who, when in the transports of villainy, strips down to black tights. Other characters are a pure heroine, a bumbling detective, an unscrupulous banker, and a lady acrobat with a circus. Sounds as though it should be fun, but there are long stretches when it isn't.

For one thing, the original series were episodes, and the audiences took them in brief doses. Providing the same episodic quality in a feature-length film inevitably results in a lack of sustained tension. Franju, too, has a way of lingering over his effects, as though he fancies them too much to let them slip by in brief takes. Thus we have a striking shot of Judex's henchmen (they, too, are dressed in black) climbing the sheer wall of a building. This makes an unusual visual pattern, but he cuts back again and again, reiterating the spidery pattern.

"I'll wait here. If the moat is now used for growing vegetables, I'd rather not see it."

He is probably correct in eschewing a tongue-in-cheek approach, for he would not dream of being disrespectful toward Feuillade, but the realistic use of setting and of minor characters (to which he pays as much fond attention as would, say, Bresson) has a way of jarring the mood of fantasy. And, since he obviously wants to stress the magical and miraculous aspects of cinema, he seems to be singularly wanting in his awareness of editing principles. He's awfully slow, in other words.

Nevertheless, I will long treasure one marvelously macabre scene that shows a masked ball in progress at the home of the banker. The guests are wearing masks of bird heads. Judex arrives in his accustomed black, wearing an eagle's head. The banker, appropriately, has chosen for his mask the head of a vulture. The way in which Franju uses his camera here is masterful, a memorable demonstration of the juxtapositional possibilities in film.

Here his sense of how long the audience will remain under the surrealistic spell of the scene seems exact. At other moments it is not, and his powers of visualization, which reach peaks of incandescence at times, ebb into periods of drabness. *Judex* must be seen, however, for Franju is a rarity among directors, a man who can make nostalgia visually tangible and who can create feelings possible only through the poetic use of cinema.

It would be unfortunate if *Judex* were to be regarded as just another example of the current *Batman, Captain Marvel,* and *Superman* "camping" expeditions in movies, television, and on the stage. There is no fun-poking in *Judex,* no attempt to be bad presumably for the sake of being good. Franju has attempted to make art out of those old days of the movies' innocence. He succeeds best not when he is mimicking the iris effects and the old-fashioned titles used between sequences—touches which he inserts as a kind of tribute to the past—but when he conceives freshly and inventively on his own, using techniques that would have been far too sophisticated for Feuillade.

The challenge he undertook was tricky: to form conscious art of what at the time was lurid naïveté. To make the thing work at all would have required a consistent style, which, judging by this film, Franju does not possess. But if the total vision has eluded him, the try was eminently worthwhile, if only because it reminds us that movies can be of the very same stuff that dreams—and nightmares—are made of.—HOLLIS ALPERT.

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Surveying London's Season

LONDON.

THE STATE of the theater seems about the same on both sides of the Atlantic. When I left New York, twenty-eight Broadway playhouses were occupied by eight American and two British musicals; eleven American comedy or suspense productions; five plays imported from England; one revival; and one serious American drama.

Here in London's West End, some thirty-two theaters offer eight British and three American musicals *(Hello, Dolly!, Funny Girl, The Sound of Music);* thirteen British comedy or suspense productions; two American plays *(Barefoot in the Park, The Owl and the Pussycat);* three revivals; and three comparatively serious British dramas. The last two categories probably will be of most interest to Americans.

The revivals include Dame Sybil Thorndike in *Arsenic and Old Lace;* Alan Badel and Sian Phillips in *Man and Superman;* and Sir Ralph Richardson in *You Never Can Tell,* which is scheduled to come to New York next season. Sir Ralph is an actor who always brings his own quality of grotesquely comic and superbly melancholic alienation from life to whatever role he plays, and his performance as the waiter serves to add a dimension to the comedy that probably never occurred to Shaw.

Of the serious British plays the most successful is Frank Marcus's *The Killing of Sister George,* also coming to Broadway in October. While much of it is patently comic, this fable of an aging lesbian soap opera star who is written out of her job and bought out of her young companion is honest and touching in many of its excellently acted scenes.

Also presenting a realistic portrait of homosexuality as a way of life, rather than a disease, is Noel Coward's new trilogy, *Suite in Three Keys.* The first and longest of the trio, *A Song at Twilight,* shows us a character with much resemblance to the late Somerset Maugham, played by Mr. Coward himself. The play, which for too much of the time sputters in prolonged nasty banter spiced with middle drawer Coward wit, blossoms at the end, when Irene Worth, as the author's secretary-wife, reveals her genuine fondness for a husband she doesn't love – one who has used her abominably to do his dirty work and camouflage his private life. With characteristic generosity, Coward allows Lilli Palmer, who plays the author's not-at-all sacred old flame, to one-up him most of the evening. However Coward does eventually explain that his author has played life by the rules in a world where it may be still some time before a homosexual can live openly without a sense of shame, and has avoided sentimentality without quite losing his human vulnerability to emotion. At the play's end he gives us a private glimpse at the lonely soul underneath the caustic exterior, and we can both pity and admire this man, who in the play is so aptly described as being an "unregenerate old bitch."

The third serious work—closing, unfortunately, but happily slated for American production in the fall—is Donald Howarth's *A Lily in Little India.* It consists of a series of incidents demonstrating poetically how beauty can grow despite the handicap of stultifying family obligations. Since its theme is universal, one would hope that an American version will be without the barrier of British detail and dialect, and the play's weak ending.

At the Old Vic the National Theatre continues to be oversubscribed with its quality productions featuring such stars as Sir Laurence Olivier, Albert Finney, and Maggie Smith. Scheduled new productions are *Juno and the Paycock* and John Osborne's adaptation of Lope da Vega's *A Bond Honored,* on a double bill with Peter Shaffer's *Black Comedy.* The Shaffer farce represents the sole new British play to originate with the National Theatre in its three-year existence, and is a great audience pleaser. In this short work, Mr. Shaffer has toyed with the brilliant idea of performing in the dark until a fuse blows. Then we see the lights go up to reveal the comic antics of people trying to maneuver in the dark.

The Royal Court Theatre, which has introduced the majority of the last decade's most distinguished new British plays, is offering in repertoire revivals of *Serjeant Musgrave's Dance* and *The Voysey Inheritance,* and the first production of Arnold Wesker's latest play, *Their Very Own and Golden City.* The latter, which deals with an architect's difficult campaign to build an ideal city totally owned by the people who live and labor in it, promises to be the most substantial and important play of the current London season.

—HENRY HEWES.

Your Literary I. Q.

Conducted by John T. Winterich and David M. Glixon

BEFORE AND DAFTER

Beatrice E. Barnes of Lexington, Kentucky, is fascinated by what can happen to a word if you remove a letter from its beginning (as with nos. 1-6) or its end (as with nos. 7-12). She has provided clues—as misleading as she could devise—to their before-and-after meanings. The dashes are filled in on page 103.

Behead: *and Get:*

1. What goes under the bottom: — — — — —/What comes out on top.
2. What goes there from here: — — — — —/What comes down from up.
3. Those that swill: — — — — —/What we shouldn't swill.
4. Sunup: — — — — — — —/Sunshade.
5. A shoe shouldn't: — — — — —/Part of a foot.
6. What is usually tired: — — — — —/End of a loaf.

Curtail: *and Get:*

7. The top man: — — — —/His relatives.
8. His embrace: — — — — — —/He means it.
9. A bad neighbor: — — — —/A whelp.
10. What the world could end with: — — — —/What to do with the bomb.
11. Helper of bulls and bears: — — — — — —/What you are when he's wrong.
12. A fall guy: — — — — —/A pal.

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Historic Reversal for the FCC

THREE JUDGES of the U.S. Court of Appeals in the District of Columbia, in a lucid, historic opinion, have literally changed the rules of broadcasting regulation—opening the way for the public to have a voice in determining whether a station has operated in the public interest. They held, on March 25, 1966, that the Federal Communications Commission erred in renewing the license of WLBT, a television station in Jackson, Mississippi, and they directed the Commission to hold hearings on the station's renewal application.

The case, under FCC scrutiny since 1955, would never have come to so unexpected and stunning a denouement, had it not been for the Office of Communication of The United Church of Christ, directed by the Reverend Everett C. Parker. In 1964 the church petitioned the Commission to deny WLBT's application for renewal. It asked for hearings to present evidence that the station was guilty of racial and religious discrimination and of excessive commercialism. The FCC, by a four to two vote, dismissed the petition and granted the Jackson station a restricted, conditional license renewal for one year instead of the customary three.

The Commission, in effect, thus accepted the charges of the church's Office of Communication, but ruled that the city "needed" a second TV station, and put WLBT on probation. Chairman E. William Henry and Commissioner Kenneth A. Cox dissented vigorously from the majority view, arguing that a renewal could not properly be granted until hearings resolved factual issues raised by the church petition. Ordinarily that would have ended the matter: the FCC had "ducked" another tough case, shown leniency to a licensee, and refused to give a public group, the United Church of Christ, "standing" which would have made hearings mandatory under the provisions of the Communications Act.

The right to intervene officially in a license renewal had been granted only on grounds of "economic injury" or "electrical interference." Standing, thus, traditionally had been granted to competing stations but not to the listening public. Presumably the audience did not suffer any "injury," and allowing it standing "would pose great administrative burdens" on the Commission. Mr. Parker, backed by his church, deemed the matter too important to drop. Ignoring the gloomy predictions of top communications lawyers, he appealed the FCC decision to the federal court.

The Court of Appeals judges—Burger, McGowan and Tamm—had probably never attended a convention of the National Association of Broadcasters. More interested in theoretical law than in industry practices, they looked at the record and stood the FCC on its head at every point of the argument. They emphasized that "standing is accorded to persons not for the protection of their private interests but only to vindicate the public interest."

"We cannot believe," the judges added, "that the Congressional mandate of public participation . . . was meant to be limited to writing letters to the Commission, to inspection of records, to the Commission's grace in considering listener claims, or to mere non-participating appearance at hearings . . . Consumers are generally among the best vindicators of the public interest. In order to safeguard the public interest in broadcasting, therefore, we hold that some 'audience participation' must be allowed in license renewal proceedings."

As for WLBT's license, it is not long for this world if the FCC takes seriously one sentence of the Court's opinion: "We agree that a history of programing misconduct of the kind alleged would preclude, as a matter of law, the required finding that renewal of the license would serve the public interest." The key phrase is "as a matter of law." It suggests the irrelevance of any reforms WLBT may adopt during its probationary period. "When past performance is in conflict with public interest," the judges said, " a very heavy burden rests on the renewal applicant to show how a renewal can be reconciled with the public interest."

The judges squelched the FCC's argument that Jackson "needed" the WLBT renewal, even though the station had been unfair to its Negro community (50 per cent of the area population). The area, said the Court, might better be served "with one TV outlet acutely conscious that adherence to the fairness doctrine is a *sine qua non* of every licensee." The Commission, thoroughly spanked, has decided not to appeal to the Supreme Court; and it has ordered a hearing. WLBT could appeal, but it would be foolish to go to the high court with a case so apparently blemished with racial discrimination. The church's Office of Communication, preparing for the hearing, reports that the station even now is still discriminating against the Jackson Negro community.

Mr. Parker deserves an award for courageous public service. His church has shown the way not only to other churches concerned with the impact of the media on their congregations, but also to civic associations, professional societies, unions, and educational institutions. Captious or purely obstructive protests are not in order. But informed, organized monitoring and evaluating of performance versus promise, as the court stated, can provide "a means for reflection of listener appraisal" of a licensee's statutory obligation to operate in the public interest.

Perhaps the FCC in the future will hesitate to renew a license without a hearing when serious issues of fact are involved, and stations will hesitate before politely brushing off complaints from articulate public groups.

—ROBERT LEWIS SHAYON.

The Soles

By David Wagoner

THE soles are lying in shallows off Dungeness Spit.
They rest on vacant sides and stare at the sun.
Their skin like sand is glowing against the sand.

The tide has come and gone. It comes again.
The soles are lying still as their own breath.
The ocean passes through the straits of their gills.

One eye has moved an inch in a million years
To join the other on the burning side,
Drawn up like a moon from underlying night.

They dart and bury themselves as we drift over.
They cloud the sand across their speckled halves.
Their fixed, their wandering eyes stare up again.

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Pulitzer Prizes

Continued from page 74

work that will live forever in American literature, drama, music or journalism. But even worse for the awards process, it sometimes happens that distinguished works come in clusters. There have been times when two or three major contenders were considered for a single prize, each having its passionate advocates. Thus, in 1921 the fiction prize went to Edith Wharton, the reigning queen of American letters, for *The Age of Innocence,* rather than to the young Sinclair Lewis for his *Main Street,* which accounted for his later displeasure with the board. Such unhappy coincidences do not add to the annual festivities on Morningside Heights. But it has happened in the past, and probably will again, that the disappointed authors of fine works, such as *Life With Father,* will be rewarded another time for other works, as were Howard Lindsay and Russel Crouse for *State of the Union.* There is nothing deliberate about this, for different juries and usually a board of different composition make the recommendations.

When the selection process is analyzed, there are no self-evident truths. Instead there are various problems of principle that must be resolved. One that has perplexed many a jury over the years may be stated as follows: Should a candidate be rewarded at the outset of his career, and therefore encouraged to go on to greater work, or should the prize be given to those who are established even if their best work is already done?

There are examples of both in the Pulitzer records.

In 1920 Eugene O'Neill won a Pulitzer Prize for his first major play, *Beyond the Horizon,* and went on to win three more, the last posthumously for *Long Day's Journey Into Night.* In 1928 Thornton Wilder won a Pulitzer Prize for his first major work, *The Bridge of San Luis Rey,* and went on to win two more awards for *Our Town* and *The Skin of Our Teeth.* In 1940 John Steinbeck won an award for his great novel *The Grapes of Wrath,* although at the time he was better known than were either O'Neill or Wilder when they received their first awards. Steinbeck later became a Nobel Prize winner.

The outstanding instances in the Pulitzer records of artists who were rewarded after they had become famous are, of course, Ernest Hemingway and William Faulkner. Hemingway's *The Old Man and the Sea* was given a Pulitzer Prize in 1953, the year before he won the Nobel Prize. Faulkner's Nobel Prize came in 1949, years before he twice received Pulitzer Prizes.

The most spectacular example of an unknown who received a Pulitzer Prize and went on to enormous popular success is James A. Michener, who in 1948 was brought to public attention when his *Tales of the South Pacific* won a Pulitzer Prize. One of its stories became the basis for *South Pacific,* by Richard Rodgers and Oscar Hammerstein II, under Joshua Logan's direction, which two years later won a Pulitzer Prize of its own.

It is clear, therefore, that critics who seek a set of rules to bind the juries or the board have little basis for their proposals. The jurors should be free to award a prize to a young writer in one year, if they see fit to do so, or to give the accolade to an older one who probably has done his best work. Tradition, the law, and the calendar are sufficient handicaps; esthetically, the judges should have the greatest freedom, and this the university has alway tried to give.

HOW has it gone, then, over fifty years?

Of the illustrious dead in the arts, O'Neill and Robert Frost, the poet, each won four Pulitzer Prizes in drama and poetry respectively, while Robert E. Sherwood won three in drama and one in biography. Edwin Arlington Robinson won three times for poetry and Douglas Southall Freeman twice in history.

Of the living, Wilder and Archibald MacLeish are three-time winners, with a wide range of illustrious ones who have won twice, including Samuel Barber, Samuel Flagg Bemis, Richard Hofstadter, Margaret Leech, Gian-Carlo Menotti, Samuel Eliot Morison, Allan Nevins, Walter Piston, Carl Sandburg, Richard Rodgers (with Oscar Hammerstein, who is dead), Robert Penn Warren and Tennessee Williams. It would be impossible within this article to list the individual winners, many of whom are as distinguished as some of those already mentioned.

In journalism, the only public service triple winners have been the Chicago *Daily News* and the St. Louis *Post-Dispatch,* with the *New York Times,* the Los Angeles *Times,* and the New York *World* each winning twice. Of the journalists individually, Arthur Krock won two prizes and attained the distinction of having been denied a third prize for an exclusive interview with President Truman because he was a board member at the time. The only authentic triple winners in journalism, therefore, are the late cartoonists, Rollin Kirby and Edmund Duffy, although there are a number of double winners.

It has been said in the past that the Pulitzer Prizes shy from the critical and the unpleasant in American life, but tend to conform to largely middle-class prejudices. The record does not bear this out. O'Neill, Sidney Howard, Elmer Rice, Tennessee Williams and Arthur Miller scarcely concentrated on an effort to please Main Street. Nor did Willa Cather, Upton Sinclair, Marquand, Steinbeck, and James Gould Cozzens, to name only a few, write for middle-class consumption. If there were yawps of displeasure because Margaret Mitchell's *Gone With the Wind* won Pulitzer recognition in 1937, time appears to have justified the verdict. As for the instances in which more recent critics have assailed various refusals to present awards, time also seems to be on the side of the Pulitzers.

True, Theodore Dreiser, Thomas Wolfe and Scott Fitzgerald are not among those in the Pulitzer records (although, oddly enough, Ketti Frings's play about Wolfe won a prize). And there are some winners whose names are not readily recognizable by the public today. But as to the former, it is inevitable that not everyone can win an annual prize, conditions and terminology being what they are. (Leo Tolstoy and Thomas Hardy are among those who did not win the Nobel Prize for literature.) As to the latter, it is equally inevitable that not everyone who wins a prize will remain famous: for example, Johannes V. Jensen and Frans Emil Sillanpaa are among the Nobel Prize winners in literature.

If there is one certainty about the Pulitzer Prizes, it is that they will continue to be watched carefully and examined closely, both on and off Morningside Heights. Too, the monetary reward—currently $1,000 for journalism and $500 for letters, drama, and music—will mean less than the prize itself. To the inevitable controversies that are bound to arise, Joseph Pulitzer II gave an answer during the late Forties that still seems pertinent:

"That they occur is evidence that the prizes are taken seriously. I believe it would be an unhealthy situation if the whole thing were cut and dried, for it's inevitable that active, conscientious men will disagree on the technique or the execution of a projected idea. My father, I'm sure, would have preferred vigorous controversy to dull acceptance. Certainly his papers were militant, and he always enjoyed a good, sincere scrap on live issues."

In 1903, Joseph Pulitzer I wrote of his expectations for the prizes when he proposed his gift for the Graduate School of Journalism and the awards: "To the plan of the prizes I am much attached and believe that in the future it will be of the greatest possible benefit and renown to the university, possibly greater than the school itself . . ."

It is not for us at Columbia to say how well these hopes have been fulfilled. That judgment is left to history.

LITERARY I.Q. ANSWERS

1. chair. 2. train. 3. swing. 4. dawning. 5. pinch. 6. wheel. 7. king. 8. caress. 9. Cuba. 10. bang. 11. broker. 12. chump.

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LIBERTY PRINTS—remember them? Unsophisticated, dainty, washable: "Tana" lawn, 36", $2.50 per yd. pp. —white on red, black on white, tiny blue or pink on white. "Tebilized" sheer linen, blue/pink/yellow/green on white, medium sized print, 36" $4.00 per yd. pp. Carol Brown, Putney, Vermont 05346.

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MONACO, anyone? For the first time in about 400 years, something new has been added to a regular deck of Playing Cards, creating a new family of card games. At least one word can be made with ANY TWO cards in the deck without repeating a word. WOW! See what our $10,000 challenge is all about. 2 deck box, including booklet of rules, $3.00 postpaid. Single deck $1.75. Combo Playing Cards, Inc., 2408 Guardian Building, 500 Griswold Street, Detroit, Michigan 48226.

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YOUR GLOBAL ADVENTURE. Largest journal of actual positions for teachers, administrators, students, librarians, scientists, etc. NOT just a list—includes specific U.S. and foreign positions open now. Includes summer jobs. Approved since 1952. RUSH $1.00 for current issue. Yearly membership $7.00. Manual, "Teaching Opportunities in England," $1.00 or FREE, with yearly. Advancement Institute, 171 North 9th Street, Brooklyn, N.Y. 11211.

PERSONALS

PUBLIC RELATIONS EXECUTIVE AVAILABLE—a 50-year-old PR expert with diversified worldwide experience. Press relations, editing, writing, special events, promotional tie-ins, community relations, corporate know-how, financial talents, counseling, management skills. Courage, imagination and ingenuity, tempered by the practical judgment of mature experience. Interviews arranged. NYC. Box P-860.

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ADULT DEGREE PROGRAM for men and women over 25 seeking liberal arts education. B.A. degree may be earned through series of six month study cycles combining two week seminars on campus twice yearly with independent study at home. Openings in new cycles starting in July 1966 and January 1967. Write Box S, Adult Degree Program, Goddard College, Plainfield, Vermont 05667.

RESEARCH, writing, translations, expertly done. All topics. Reasonable. Professional author. Alex White, Allenhurst, N.J. 07711.

FRESH FLOWER PERFUMES, hand blended, of exquisite fidelity to living flowers. Circular. May Cove, Mathews, Virginia 23109.

CASH FOR YOUR BEST TWIN STORY: First prize $250, 20 second prizes $20 each. Anyone with twins in immediate family may compete. Nothing to buy. Contest closes June 1st, 1966. Write for entry blank: Dept. S, J.B. Lippincott Company, East Washington Square, Philadelphia, Pennsylvania 19105.

MAMSELLE IN MANHATTAN. Unique consulting service for young women moving to NYC. Assists in finding apartments, employment. Write for free brochure. Box S-83.

BRITISH SHOES FOR GENTLEMEN, at a fraction of their American retail prices. $12.95 includes duty and import charges. Delivery in ten days from receipt of order. Money-back guarantee. Write for illustrated catalogue. Steven Williams, Sr., Ltd., 37 East Willow Street, Millburn, New Jersey 07041.

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SUMMER JOBS—Over 43,000 summer jobs (also 8,000 permanent) open right NOW in U.S. and Overseas. Gives specific job data, salaries, addresses, etc. Hurry! Jobs are filled early. Used and approved since 1952. Regular price $5.00. Special—rush $4.00 now for new 1966 "Summer Job Directory." Resume manual $1.00 or FREE with order. Summer Job Center, 173-SR North 9th Street, Brooklyn, N.Y. 11211. (Add 25¢ regular mail, add $1.00 first class.) Also "Summer Opportunities for Teenagers" (includes jobs; part-time work; travel, sports, special interest, foreign camps, etc.), $3.00. Supply limited.

MARK HOPKINS COLLEGE, Brattleboro, Vermont, interested in eager, creative, emotionally mature students for entrance to unique new school. Innate intelligence, yearning for learning, not Board scores, basis for consideration.

SERVE HUMANITY and your curiosity in U.S.-Soviet Exchanges. Your State Department wants continuing contact with Russians to ease tensions. Find out how Citizen Exchange Corps, a private group, brings Americans of every age to Russia for three weeks to meet ordinary Russian people. To learn how you participate, write Citizen Exchange Corps, Dept. SR, 550 Fifth Avenue, New York, New York 10036.

MERITORIOUS RESTORATION. Antique, Modern China, Ivory, etc. Sano Studio, 767 Lexington Avenue, NYC 10021.

ORIGINAL MASTER CONCERT Classic Guitars from leading Spanish makers—Solar, Conde, Aguado, Martinez de Milan, etc., etc. from $80 to $1,200. Also fine lutes and violins shipped on 5 days approval. Finest repairing, restoring by mail. LOCKER'S-IMPORTERS, 21 South 18th Street, Philadelphia, Pennsylvania. 215-LO 7-2972.

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PERSONALS

RECENT Ph.D. IN AERONAUTICAL SCIENCES (Gas Dynamics) seeks university teaching-research position. Present post doctoral fellow at major university. Box R-468.

REWRITING, SPEECH WRITING. Male writer-editor, Phi Beta Kappa, nationally published. Experienced in social science, psychology, religious writing, political speeches, and promotion. Box P-22.

FASCINATING BIRD BOOK. This big "Birds of Australia" book has more than 70 full-color large photographs, including such unusual, exotic, beautiful birds in native habitat as the Lorikeet, Crimson Rosella, Boobook Owl, Lyrebird, Kookaburra, 65 others; with full descriptions, big map of Australia. 16" x 11", 44 pages. A permanent, colorful, fascinating addition to your library. Comes to you from Melbourne by Sea Mail. Send only $2 to Bird Book, The Australian, SR, 230 West 41st Street, New York, N.Y. 10036.

VIOLINIST, VIOLIST, CELLIST for Franconia College Summer Concerts June 22nd-August 30th. Coaching by experienced professionals. Salary plus room and board. Larry Lemmel, Franconia College, Franconia, N.H.

GO DOWN TO THE SEAS again. Hang a driftwood mobile! Details, Box S-373.

LONDON TAXIS 1957-1960. 3 or 4 door. Gas or Diesel. Police Inspected for U.S.A. Registration. Reconditioned: recap tires, meter, all rechromed, repacked leather seats, motor, drive train reconditioned, safety glass, English license plate. Many satisfied U.S. purchasers. $1,475 delivered East Coast ports. Counterpoint Marketing Ltd., 44 Conduit Street, London, W.1, England.

RAW SILK "kiimo" lounger . . . comfort personified. Twelve exquisite colors. Write for free swatches. The Orient Express, P.O. Box 2626, San Francisco, California 94126.

THE ARTS CENTER AT GODDARD COLLEGE is a time and place for adults seriously interested in chamber music, painting, sculpture, ceramics, dance, drama, to work alone and together with a skilled staff. Stay for a week or more in July or August. For information write to Ray McIntyre, Director, The Arts Center, Goddard College, Plainfield, Vermont.

FASCINATING MAGAZINE for book collectors! Information free. BLM, Box 157-31, Webster, New York 14580.

FOOT COMFORT—Double deerskin moccasins, slippers, casuals, 50 styles. Free catalogue .SR. Cottage Crafts, Rutland, Vermont 05701.

VALENCIAS, FLORIDA'S FAMOUS ORANGES, shipping through June. Send for free brochure. Airport Fruit Shipper, Miami International Airport, Miami, Florida 33159.

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UNUSUAL, INEXPENSIVE, DELIGHTFUL PRESENTS shipped direct from Europe. Free catalogue. Europresent, Sharon, Connecticut.

MAKE $12 PROFIT each dozen sewing aprons. Details free. Redikuts, Loganville 44, Wisconsin.

CHARMING CHARCOALS. Portrait sketches created from photos. Gemery's, 365 Longhill Avenue, Shelton, Connecticut 06484.

ONLY SPEAKER IN THE WORLD *with patented Magnetic* Suspension and patented all polymer cones. Brochure. Hartley, Box 685, Ho-Ho-Kus, N.J. 07423.

ARTS-HUMANITIES "Grants Indicators #1"—Planned categories and dollar amounts. How to apply to U.S. Arts Foundation. $2. "Grants," 115 5th Street, S.E., Washington, D.C. 20003.

OPERATE LUCRATIVE Information Service (Research). It's terrific! Free literature. Career Aids, 119 11th Avenue, San Francisco, California 94118.

MINIMALLY HANDICAPPED YOUNG ADULTS—live with professional family on farm. Training in skills for independent living. Highland Community, Elizabethtown, N.Y.

SUMMER VACATION-STUDY PROGRAM for adults, Michigan State University campus, July 18th-22nd. 14 lectures, Fine Arts Festival, recreation. Write Vacation-Study, 18 Kellogg Center, East Lansing, Michigan.

(Continued on page 106)

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PERSONALS

(Continued from page 105)

FREE! DWIGHT D. EISENHOWER—Waging Peace. The White House years 1956-1961. Cigar Smokers: Get this $6.95 book free! Clip this ad, send with 50 Garcia y Vega cigar bands to P.O. Box 3583, Philadelphia, Pennsylvania 19122. Include name, address, zip code. Act now . . . offer limited.

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BEAUTIFUL GREETING CARDS designed and handcrafted by young woman for people of discriminating taste. Box S-315.

$10 DAILY writing short articles at home! Begin immediately! Copyrighted Report reveals how and where. Send $1.00. PanAm, Box 11796, Atlanta 5, Georgia.

CULTURED MAN/WOMAN act as secretary for retired man and wife and manage their Westchester household. Live in or out. Box S-325.

MAN WILL SHARE his Manhattan apartment with tourists, weekly basis. Box S-311.

FRENCH TEACHER available for private lessons. Telephone: 212-PL 2-4930.

EXPERIENCED SECRETARY, Girl Friday, seeks part-time or periodic employment. Bilingual French-English. Resident Boston. Would travel New York, Paris, London (possibly elsewhere). Box S-384.

INTELLIGENT, ATTRACTIVE GIRL beginning graduate study on Woodrow Wilson Fellowship, major—Philosophy, Psychology, seeks interesting summer job. Box S-61.

COLLEGE JUNIOR, FEMALE, personable, desires interesting summer position. Box R-985.

17, COLLEGE-BOUND, desires scenery change—wants work, travel. Charles Skrief, International Falls, Minnesota.

PROGRAM ANNOTATOR with top experience available for concert, liner notes, radio music commentary: symphony, opera, jazz. Box S-372.

MOTHER'S HELPER wants board and $5 weekly at resort. 212-JU 6-6159.

VANDERBILT MALE, 26, B.D., graduate studies in Music; wife, 24, M.M. organ seek challenging permanent employment in U.S. or abroad. Box S-318.

UNUSUAL WOMAN, secretarial background, seeks unusual work, Detroit area. Box S-354.

COLLEGE GRADUATE, 22, seeks summer governess position with traveling family. Box S-369.

MALE, 28, school administrator, seeks interesting summer position—travel. Has European travel experience. Box S-377.

COLLEGE JUNIOR, male. Water safety instructor. Chauffeur's license. Summer work either area. Will travel. Available June 1st. Box S-374.

MOTHER'S HELPER desires interesting summer. Adores children, experienced, can drive. Available June 10th. Box S-380.

UNIVERSITY OF WISCONSIN junior, male, News Editor Daily Cardinal. Seeks summer experience in mass communications—metropolitan NYC. Box S-391.

EMPLOYMENT OPPORTUNITIES

SUMMER JOBS in the Rockies! Over 2,000 resorts, dude ranches, camps, construction companies, national parks, etc. shown in Rocky Mountain Summer Employment Guide. Also: how to get free transportation and information on summer stewardess positions (U.S. and overseas). Hurry, most hiring done in April and May. Only $3.00. University Publications, Dept. A22, Box 6013, Denver, Colorado 80206. Money-back guarantee!

CAMP COUNSELORS—Long established boys' camp in Berkshires (Massachusetts) invites inquiries from men teachers, grad students interested in working with young people in camp setting. Rich opportunity to work with talented staff. Openings include fine arts, ceramics, music, guitar, photography, electronics, general nature, astronomy, birding, ham radio, tennis, swimming and small craft. Camp Mah-Kee-Nac, 377 Irving Avenue, South Orange, N.J. 07079.

EMPLOYMENT OPPORTUNITIES

TYPISTS, STENOS—EXPERIENCED—Manpower Inc. needs you for temporary assignments. Work a day, a week or longer. High hourly rates. See telephone directory for address in your city.

WRITER WANTED. Major management magazine in dire need of creative writer to back up promotion director and produce sales presentations, collateral materials and publicity on occasion. Interested and qualified? Write Box S-223.

EXECUTIVE SECRETARY, architect's office, university community, college background required. Please send resume to P.O. Box 178, Ithaca, New York.

WANTED: Summer employment. All around experienced group counselor for challenging work with emotionally disturbed children in residential day camping program. Must have own living accommodations. June 27th to August 26th. Write or call: Mr. William Rosenblatt, ACSW, Group Work Supervisor, Children's Village, 1680 Albany Avenue, Hartford, Connecticut. Telephone 236-4511, Ext 238.

HOUSEPARENTS: Couple without dependent children needed for private coeducational school serving adolescents. Challenging experience in community living and working with young people. Year-round employment, good salary, vacation and fringe benefits. Contact Executive Assistant, George Junior Republic, Freeville, N.Y. Phone: 607-844-3114.

SPECIALTY COUNSELORS for coed camp in northeastern Pennsylvania—male and female—sailing, folk dance, archery, dramatics, tennis. Call or write Pine Forest Camp, 8000 York Road, Elkins Park, Pennsylvania 19117. 215-CA 4-2100.

ASSISTANT PROFESSOR OF PSYCHOLOGY in eastern Liberal Arts College. Long-established, respected, but adventurous institution with superior academic standing. In small community ideal for family but short drive to metropolis. Applicant must have Ph.D. or be close. Send complete resume of professional experience and salary requirements to Box S-310.

MONTESSORI TEACHERS. Established school in upper midwest desires 2 experienced professional directresses. Salary commensurate with qualifications. Box S-368.

HOUSEPARENTS—single or couples. Work with children with emotional and social problems. Live-in position. Experience preferred but not required. Apply Miss Nagel, Jewish Child Care Association, 345 Madison Avenue, NYC. 212-689-7900.

SECRETARIAL OPPORTUNITY. Developing school needs helpful, creative gentlewoman. Unusual benefits. Box S-352.

CAMP ZAKELO (boys 8-15)—Harrison, Maine, requires: Administration. Concerned Teacher Staff for athletics: Crew, Fencing, Campcraft—Tripping. Cultural Activities. Journalism. Printing. Band—piano. Radio—electronics. Earth Sciences. Reading Dynamics. Tutoring. Expert Food Manager. Dining Hall Manager. Director Zak Zarakov, 393 Clinton Road, Brookline, Massachusetts. 617-LO 6-6200.

CAREER TEACHING BLIND CHILDREN. Scholarships; undergraduate, graduate programs. Box S-378.

ELEMENTARY TEACHERS NEEDED. Glacier Park—Big Mountain ski country. Challenging changes education program. L. A. Muldown, Superintendent, Box 198, Whitefish, Montana 59937.

SINECURE OPEN to manage small Florida island estate. Older couple wants to delegate domestic details and servant supervision to stable, intelligent person. Light duties, separate cottage, quiet life would be suitable for writer or pleasantly self-sufficient person. Box S-346.

HOUSES AVAILABLE

For Sale

EARLY 19th CENTURY schoolhouse converted into charming 2 bedroom year round or summer home. Furnishings available. Near Rhinebeck, Taconic Thruway. Settle estate. R. E. Carlson, 1000 East Avenue, Rochester, N.Y. 14607.

GUILFORD, VERMONT—Secluded camp in lovely wooded area overlooking Green River. Large fireplace, bathroom, half-story sleeping deck. $9,500. Telephone 802-254-5145.

NEW CANAAN VICINITY. Westchester County, N.Y. Pleasant contemporary, 3 bedrooms, 2 baths, study. 12 farm acres, hill view. $36,000. Box S-71.

HOUSES AVAILABLE

For Sale

FLORIDA, Melbourne Beach. Large living room. Ocean view. 3 bedrooms, 3 baths, double garage. Sell or trade equity for New England or Cape property. $28,500. SR Box S-389.

DORSET, VERMONT—Old village house—thorough restoration just completed. 2 living rooms—one with fireplace, other with separate outside entrance. 4 bedrooms, 2½ new baths. Good small barn. $32,500. Mrs. Edith Snare, Dorset, Vermont.

BERKSHIRES. Lovely 1810 country home. Magnificent views—acreage. 14 rooms, 4 baths, 3 fireplaces. $39,500. Box S-289.

MAINE. Overlooking Passamaquoddy Bay. House of Seven Gables. $1,100 per gable. 56 Harbor View Avenue, Norwalk, Connecticut.

FORT MYERS BEACH, FLORIDA—3 bedroom, 2 bath, new, immaculate, air-conditioned, carpeted. Beachside, boat dockage. Write for details. Under $35,000. Box 6757, Fort Myers Beach, Florida 33931.

VERMONT—5 acre estate, new Colonial, $50,000. Northgate Realty, Manchester Center.

For Rent—Furnished

NEVIS, WEST INDIES, COTTAGE, accommodates 4. Private beach, hotel nearby. $75 weekly. Box S-134.

MEXICO, SAN MIGUEL ALLENDE, Box 164. 3 bedrooms, 3 baths, 2 servants paid. June 15th-6 months. $250 monthly.

BRITISH VIRGIN ISLANDS—Beautiful house by sea—20 acres. Box S-306.

ST. JOHN, VIRGIN ISLANDS—cottage, 9 acres, breathtaking views. Weekly. Box S-393.

HOUSE ON BEACH at Harbour Island, Bahamas. 3 double bedrooms, 2 baths. Maid and car included. Will rent for two weeks or longer. Write Box S-338.

VERMONT—mountainside chalet. 3 bedrooms, all appliances, fireplace. Summer, fall $250 month, $800 four months. Box S-326.

LONDON'S GREENBELT, Baker Street 28 minutes, fully furnished house, full gas-fired central heating, 3 double bedrooms, living room, library, modern kitchen, garage, large garden backing woods. $170 per month, excluding utilities, including taxes. Available July for coming year. Box S-394.

MEXICO, SAN MIGUEL ALLENDE, Box 164. 3 bedrooms, enclosed patio, heated pool, central. $300 monthly, 2 servants paid. June-October.

For Summer Rental

VERMONT RENOVATED FARMHOUSE near Appalachian Gap. Swimming on premises, golf nearby. $125 first week, $100 succeeding. Stark Mountain Farms, Starksboro, Vermont 05487.

CARMEL, N.Y. 58 miles NYC. Small 2 bedroom cottage. Ideal for couple. Screened porch. Swimming. May-October, $650. Will sell. Box S-347.

STOWE—Chalets viewing Mt. Mansfield—long or short term. Swimming and tennis. Area 18 hole golf and summer theater. Logwood, Stowe, Vermont 05672.

CAPE COD COTTAGES—Seasonal to bimonthly. $390-$1,000 monthly. Covering several seashore villages and towns. For detailed descriptions, write or call Nauset Summer Rental Center, Dept. D, Orleans Center, Massachusetts. Phone 617-255-0552.

SOUTHERN VERMONT award winning ski lodge, mountain stream under entrance, waterfall, swimming pond. 5 bedrooms, 3 baths. Low off-season rental. Box S-234.

LOVELADIES, LONG BEACH ISLAND, New Jersey. Charming small house near ocean. 3 bedrooms, sun deck. Season $2,000. SR Box S-324.

VERMONT—Restored Colonial, all conveniences, linens. 3 bedrooms. Beautiful countryside. Sports, restaurants nearby. $500 July-August; $275 month. Box S-375.

ADIRONDACKS—Fourth Lake, N.Y. Lake Luzerne 4 room equipped cottage. Private lake. Professional community. Near Saratoga Festival. 212-HA 8-8892.

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HOUSES AVAILABLE

For Summer Rental

SUGARBUSH, VERMONT—2/4 bedroom modern houses adjacent National Forest. Near golf, swimming, horseback riding. Weekly/seasonal. 9-6 p.m. 212-752-4745, Box S-320.

BRIDGTON, MAINE. *Roomy cottage, 500' wooded* shorefront, small quiet lake. $125/two weeks, 7/1-8/13. Box S-353.

WALLINGFORD, VERMONT—Secluded 1850 mountaintop Colonial, fireplaces, spectacular view. Large or small family, week, month or season. Box S-382.

FOR SUMMER RENTAL, May-October, $600, or for *sale, $36,000: 870 foot frontage on beautiful* Lake Champlain, 4 acres parklike land: Charming writer's cottage, sleeps six. Fully equipped, furnished, on Grande Isle. SR Box S-381.

VERMONT CHALET, Bromley area, 100 acres, ponds, brook. $100 per week. Rodman Saville, 5111 Woodway, Houston, Texas.

HOUSE WANTED

For Summer Rental

GRANDMA WANTS, for July, clean, convenient house directly on Maine coast for 5 responsible adults, 3 children. Bradley, 4015 Thornapple Street, Chevy Chase, Maryland. 301-652-4165.

HOUSES FOR EXCHANGE

MEMBERS EXCHANGE HOMES for rent free vacations. Write: Vacation Exchange Clubs, 550 Fifth Avenue, New York 10036.

HOLIDAY HOME EXCHANGE BUREAU will arrange between reputable approved people. Write Box 555, Grants, New Mexico 87020.

APARTMENTS AVAILABLE

For Rent—Furnished

SAN FRANCISCO—Russian Hill penthouse. Panoramic view, sun deck, balcony. 2 bedrooms, 3 baths. July 1st—6 months. $875 monthly. Box S-364.

For Summer Rental

VERSAILLES, completely furnished apartment, 4 bedrooms, July-October 1st. $260 month. Write CELIER, 85 Avenue de Saint-Cloud, Versailles, France.

MANHATTAN EAST 90s, July-August. 5 rooms, antique furniture, reasonable. References. Box S-370.

CAMBRIDGE, MASSACHUSETTS, near Harvard Square. 2 room apartment overlooking river. Write Mrs. Buell, 988 Memorial Drive.

NYC—60s EAST. Hi ceilings, stained glass. Paneled walls, fireplace, furnished with antiques. 3½ rooms; one available as workroom, study, etc., with workbench. Perfect decorator, architect, research, etc. $300 month. Mid-June to September. 212-688-3955 or Box S-376.

BACHELOR'S STUDIO APARTMENT, East mid-70s, NYC, summer sublease. $85 month. Box S-367.

NYC. Ideal family apartment available immediately through October or part. Modern 2 bedrooms, 2 baths, air conditioner, dishwasher, doorman. 212-EN 2-6257.

NEW 3 1/2 ROOM APARTMENT, Port Washington, Long Island. Completely furnished, air conditioner, June 25th through Labor Day, $400. 516-883-9183.

SIXTIES-MADISON, NYC. Air-conditioned. $700. July-August. Box S-329.

APARTMENT WANTED

Unfurnished

HOSPITAL RESIDENT AND FAMILY seek 3½-4½ room unfurnished apartment, East Side New York. Must be available last week in June. NYC 628-5427.

APARTMENT FOR EXCHANGE

EXCHANGE OR SUBLET apartment in Philadelphia for Honolulu; 1 year September. Box S-355.

ROOMS AVAILABLE

Furnished

FLANDERS, N.J., vicinity Golf Course. Private quarters, gracious country living. Exceptional offer, gentleman, adults. SR Box S-379.

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OLD FARMHOUSE and spacious barn on unspoiled Vermont Lake (most of shore owned by the Wilderness Corporation, insuring no building). Farmhouse tract affords majestic lake view. Ownership includes use of lake beaches, of 2,200 acre forest with hiking trails. 12 room farmhouse, oldest in region, has triple fireplace, fine woodwork. *Despite population pressures elsewhere, restrictions* here preserve natural beauty of lake. Remaining to sell in Wilderness Community: two 1 acre lots, two 2 acre; also, further on, 3 acre lot bordering shore. All nondivisible, with building restricted. Kenneth S. Webb, Woodstock, Vermont.

MARTHA'S VINEYARD—Unusual wooded settings with unparalleled views of Vineyard Sound. Close proximity to excellent community beach. 2-6 acres. $15,000-$30,000. SR Box R-241.

MAINE—Wooded acreage—$10, $15, $25 an acre and up. Old farms, shore property, retirement homes, cottages, cabins, business opportunities. Franklin Realty Co. (Mr. Barrows), *Farmington, Maine.* Telephone 207-778-2852.

BERKSHIRE AREA. 3 to 10 acre homesites. 30-mile views, seclusion. Within half hour Tanglewood, lakes, theaters. Brochure. Overlook, Hillsdale, N.Y. 12529.

MARLBORO, VERMONT, wooded 10A. Fronting on road, backing on brook. Near College and Music Festival. $3,000. Box 598, Brattleboro, Vermont 05301.

CAMPS

CAMP CHOCONUT—A summer of constructive fun, 40 boys, 9 to 14. Campcraft, shop, natural science, work projects, farm animals, sports. Lake. 800 acres 17 miles south of Binghamton, New York, in Pennsylvania Blue Ridge Mountains. Booklet. S. Hamill Horne, Box 33R, Gladwyne, Pennsylvania.

CAMP COUNSELORS: Teachers, graduate students, note ad under "Employment Opportunities," Camp Mah-Kee-Nac.

IDEAL FOR FIRST TIME CAMPERS: Appel Farm Art & Music Center for Children, Elmer 24, New Jersey.

EXPEDITION FOR BOYS. Exploring and collecting in mountains and canyons of American Southwest by young naturalists, journalists and photographers. Staff known in school, camp and museum circles. 38th year. Hillis L. Howie, 363 South Road, Apt. C-17, Poughkeepsie, N.Y. 12601.

HIGH/SCOPE—capable youth 11-16. Flexible program with intellectual challenge. 1305 Sherman, Ypsilanti, Michigan.

GO NORTH for Fun and Adventure to Woodland in Eagle River, Wisconsin. Girls 6-16. Discover how leadership training can give you new interests, new skills, new confidence. Casual, relaxed, flexible camp life. Name your sport or activity, we have it, from riding to 'rithmetic. (Yes study, too, if you wish, in Tutorial Center-remedial, enrichment, Elementary and H.S.). Trips, horse shows, water skiing. A great summer. Write Miss C. Hanrahan, Mr. & Mrs. G. Borck. 400 East Randolph Street, Chicago, Illinois 60601.

ADVISORY SERVICE, summer camps, to meet children's needs, parents' budgets. R. Barnett, 180 West End Avenue, NYC 10023.

CAMPS

MONTANA OUTDOOR EXPERIENCE in Lolo National Forest. Supervised by U.S. Forest Service trained adults. Boys 12-17. 2, 4 or 6 week program. Box S-7.

THE FRENCH CAMP at *Peter Pan Farm. Voluntary* French lessons by Frenchman. Voluntary farm chores. Elaborate Arts-Crafts department. Music, Drama. Horseback riding, filtered swimming pool, tennis court, sports. International staff—campers. Coed, ages 5-16. Relaxed, non-competitive family atmosphere. Aart & Johanna Vos. Phone: Woodstock, N.Y. 914-679-6936.

EUROPEAN CAMP—Switzerland. Coed. 6-16. French language instruction. Sports. Excursions. Josephine McCarthy, 4705 Henry Hudson Parkway, NYC 10471.

GROVE FARM WORKSHOP in the Humanities. Boys, girls; 14 through 18. Study creative thinking through literature, history, music, drama; work projects, carpentry, forestry, gardening. June 26th-August 7th. B. S. deFrees, Director, North Rumford, Maine 04278.

ADIRONDACK WOODCRAFT CAMPS. Boys 7-18. Six age groups. Private lakes near Old Forge. Pack horse; Canadian canoe trips. Riding, riflery, fishing, tutoring. Nurses. 41st year. William Abbott, Box 2385, Fayetteville, New York.

CAMP BIOTA—Fun. Knowledge. Adventure. Natural Science. Academically talented boys, 9-14. Six weeks. Swimming, canoeing, riding, creative crafts, wilderness survival. Write Dr. and Mrs. Forrest S Evans, Joelton, Tennessee. Call NAshville 766-2494.

MAINE SAILING SCHOOL—summer camp, coed, ages 11-17, *on Penobscot Bay. Roy and Emily Hilburn,* Box 174, Lakeport, California 95453.

OUT ISLAND SUMMER SEA CAMP. In tropical Bahamas and 60' Schooner. Diving, fishing, sailing, navi*gation, etc. Coed* 12-18. *Limited enrollment,* July 16th-August 15th. $600. Brochure. Capt. A. Kadey, City Yacht Basin, Miami, Florida 33132.

SUMMERHILL, Kibbutz-like community. Summer experience for teens interested in working with people. Highland Community, Elizabethtown, N.Y.

HIGH ADVENTURE in Montana Rockies for boys 13-17. Follow Lewis & Clark trails through buffalo country under expert leadership. Trout fishing, mountaineering. Visit Glacier Park, Blackfoot Indians, western rodeos. Paul Edwards, 333 East 43rd Street, New York 10017. 212-683-6027.

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VACATIONS

VAIL, COLORADO—New apartments, electric kitchens, mountain resort area. Weekly-Monthly. W. E. Martin, 445 Newland, Denver, Colorado 80226.

VERMONT—Secluded mountain cottage, furnished, $65 weekly. M. S. Fish, Tinmouth, Vermont. 802-446-2784.

ALASKAN ADVENTURE: Virgin wilderness. Fishermen's and nature enthusiasts' retreat. Thayer Lake Lodge, Alaska Coastal Airlines, Juneau, Alaska.

HOUSEBOAT VACATIONS. *Command your relaxing* cruise on the Finger Lakes, Erie Canal, Mohawk River, miles of varied, historic waterways. Private, comfortable, carefree—and safe for children. Insured. Completely equipped galley, head, living for six. Novices welcome. Fingerlakes Houseboat Vacations, 508 Beechwood, East Rochester, New York.

COOL nights, warm days. Informal round of fun, activities, entertainment at this family cottage colony. Delicious food, lobster, cookouts, sailboats, beach, sauna, canoe trips. AAA. Write Chute Homestead, Naples 7, Maine.

ENJOY YOUR VACATION at THE LAKESIDE RESORT with your family in New England. All facilities. Entertainment. Dining room. Housekeeping cottages. Forrest *Durkee, Wolfeboro* 18, N.H.

(Continued on page 108)

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VACATIONS

(Continued from page 107)

BEAUTIFUL VERMONT—Attractive four-season vacation homesites on small highland lake. Can build to suit buyer. Jack Macleod, Wallingford, Vermont.

GRACIOUS LIVING in beautiful seacoast village. Fine food. Entertainment, own boat and auto trips. $12.50-$16.50 daily includes 3 meals. Folder. Direct service from New York. Paul R. Hurlburt. Whitehall Inn, Camden, Maine.

PROSPECT HOUSE Hotel-Motel-Golf Club. Reasonable rates! Panoramic, cool lakeside setting near Rutland (opposite Alexander Woollcott's island). GOLF, fishing, safe beach, boating, riding, tennis, dancing, movies, antiquing, special events. $65-$95 weekly. The Charles Bakers, Hosts. Write: Color Folder. Box 90-G, Lake Bomoseen, Vermont.

PEACE—REST—REJUVENATION. Intimate, charming old-world "pension." Only five guests. Beautiful hill country. No TV. House on the Hill, Worcester, N.Y. 607-EX 7-6218.

THE SEASIDE, on unspoiled Longboat Key, Florida 33577. New year 'round family resort on private Gulf beach. Folder, rates upon request.

WILD LOONS CALL, unique family camp, Indian Lake's unspoiled shores, rustic Adirondackaria, 52nd year. Peruse brochure. Timberlock, Sabael, N.Y.

INFORMAL FAMILY VACATIONS, erudite clientele, children's haven. Lake Shore Farm, Northwood, N.H.

"YOU CAN'T HARDLY GET them any more." Exceptionally fine country inn overlooking village green of picturesque Brandon. Near library. Elevator. Sprinkler. Well appointed, immaculate, comfortable, charming. Fine food, wines, liquors. Cookouts, golf, heated pool, garden, fishing stream, shuffleboard. Scenic and historic drives. Antiques, auctions, memorable. Folder. Brandon Inn, Brandon 6, Vermont.

CAPE WINDS BY-THE-SEA, West Harwich, Cape Cod, Massachusetts. Beautiful inn for 30 adult guests. Directly on ocean. Private beach. Patios. All private baths. $9-$11 per person including Continental breakfast. Weekly and off-season rates. Suites, oceanfront apartments. Brochure: The Barrows, West Harwich 18, Massachusetts.

BEDS TURNED DOWN EACH NIGHT. Beautiful eighteenth century New England inn in one of Vermont's loveliest villages. Old World charm. Gardens, tall trees, sweeping lawns. Advance reservations requested. Barrows House, Dorset 3, Vermont.

QUIET, ELM SHADED location near ocean, art galleries, shops, wharves. Small inn, apartments and motel with or without meals. Open through November. Tuck Inn Lodge, Rockport 2, Massachusetts.

BACK LOG CAMP, on Indian Lake, Adirondacks, New York, attracts those who love the unspoiled wilderness and actively welcome escape from civilization's "advantages." July 1st to September 5th. Reductions for families and longer visits. Brochure: Mrs. Henry J. Cadbury, Haverford, Pennsylvania.

ROCKPORT. You will love this photoscenic year 'round New England seacoast town. Sea birds, flowers, the leisurely pace, rockbound coast and clear, crisp air appeal to artists, photographers and vacationers. For free guidebook write: Board of Trade, Rockport 2, Massachusetts.

SAN FRANCISCO ON A BUDGET? Charming, centrally located. Hotel Beresford, 635 Sutter Street.

SEBAGO-LONG LAKES REGION . . . Maine's most accessible lakes are surrounded by pine-clad mountains. Seacoast cities nearby. Free color magazine. Sebago-Long Lakes Association, Box 16, Sebago Lake, Maine.

LAKE MICHIGAN VACATION ESTATE—concerts, resident artist, cottages, apartments, studios: 1,000' beach, pools, tennis, children's program. May-September. Sleepy Hollow, South Haven, Michigan 49090.

MONADNOCK REGION. Beauty, charm, relaxation, towering pines, swimming pool, shuffleboard, your own lodge, delicious meals. Open May to mid-October. Write Palmer Lodge, Keene 4, N.H.

EVERY SEASON there's a reason. Fishing, boating, hunting, skiing. Pleasant Mt. Chair Lift. For FREE booklet write Box 236E, Chamber of Commerce, Bridgton, Maine.

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GOOSE COVE LODGE on Deer Isle, Maine. In East Penobscot Bay. Sailing, fishing, hiking and picnics. Trained naturalist for nature lovers. An artist's paradise. Write for brochure. Dr. R. A. Waldron, Owner-Manager, P. O. Sunset, Maine 04683.

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WHITNEYS' . . . Charming Inn off beaten path. Rooms, Cottages, Motel. All seasonal sports. Famous food. AAA. Open most all year. Folder tells all. Bill & Betty Whitney, Jackson 10, New Hampshire.

UP-ISLAND on Martha's Vineyard, you're away from frantic joy-mills, free as a gull. Picturesque harbor to paint, beautiful beaches, tennis, cycling, scholarly retreats. Modern cottages (non-housekeeping) for 2 to 6 guests. $85 to $115 weekly includes 2 delicious meals daily. Lower June rates. Write D. R. Thompson, Owner-Manager, Menemsha Inn, Menemsha, Massachusetts 02552.

WINDHAM HILL FARM—West Townshend, Vermont 05359. Quiet country inn. Old magazines. Good food. Folder.

WANT TO BE an expert horseman? Spend an unforgettable vacation with us. Beginners, intermediate, advanced and pros. Individual attention from cavalry instructors. Stupendous serendipities at famous Escuela Ecuestre S.M.A., Apartado 185-S, San Miguel de Allende, Guanajuato, Mexico. Telephone 255.

NANTUCKET, fascinating island 30 miles at sea, only one hour by air from New York or Boston: White sand beaches, surf bathing (water averages 72°), golf, sailing, all your favorite sports, varied entertainment. Modern hotels, inns, guest houses. Excellent restaurants. Free illustrated booklet. Information Service, 25D Federal Street, Nantucket, Massachusetts 02554.

MAINE COAST'S BEST! Four safe, sandy beaches. Surf bathing. Sailing. Deep-sea fishing. Golfing. Yacht and boat facilities. Smart shops. Historic Colonial Village accommodations for all tastes and budgets. For details, write Chamber of Commerce, Box 7, York Beach, Maine.

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SNOWMASS LODGE, ASPEN, COLORADO. Relaxed ranch living in the incomparable beauty of the Colorado Rockies. Write Snowmass Lodge, Box D-802, Aspen, Colorado.

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FLORIDA KEYS — ISLAMORADA. Box 222R, Drop Anchor Resort Motel. AAA. Relaxed oceanfront tropical living. Efficiencies. Pool. Brochure.

TIP OF CAPE COD—Charming waterfront Cottages, Motel rooms, heated. Authentic Cape Cod setting. Private beach, deck, grounds, AAA. Masthead, Provincetown, Massachusetts.

OGUNQUIT. Famous summer vacation center. Magnificent beach, majestic cliffs, camera fans' dream. Many activities. Artists' colony, summer theater, deep-sea fishing, golf, movies. Hotels, guest houses, motels, cottages, restaurants. For Information write Information Bureau, Ogunquit 15, Maine.

REST AND RELAXATION. Vacation resort with meals, on Lake Wentworth. Modern cottages. Outdoor sports. Bass fishing. Color folder gives complete information. Point Breeze, Wolfeboro, N.H.

FALL UNDER THE SPELL of the sea as did many literary greats at this distinguished resort on Cape Ann. Quiet, restful. All rooms, suites with private baths and telephones. Broad porches. Excellent food. The Ralph Waldo Emerson, Rockport 2, Massachusetts. Telephone 617-546-6321.

ISLAND FAMILY ADVENTURE: run away with your parents for a summer of adventure at Adventure Inn on subtropical Hilton Head Island, S.C. While they relax on a 13-mile secluded beach, play tennis or golf on championship courses beside the sea—you can go blue-crabbing, horseback riding along plantation trails, bird-watching, exploring old forts and tabby ruins, hunting for sea turtle tracks and sand dollars, learning to sand sculpt under the supervision of our expert Arts and Crafts Director. Parents stay 6 days, 5 nights in a double room for just $81 each including breakfasts, dinners. Children are only a little extra. Write for brochure, Adventure Inn, Box 15, Hilton Head Island, S.C. Call 803-785-3372.

TEN MILES AT SEA: a small, tranquil inn on a serene outer island. The Island Inn, Monhegan Island, Maine. Box S.

QUIMBY'S CLUB AND INN—Opening mid-June—"Unspoiled Wilderness" — Uncrowded lake area — Vermont's Northeast Kingdom. Main lodge, recreation buildings for dining, sociability, entertainment. Rates include rooms or cottages, memorable meals, pleasing service, boats, every water sport, real fishing, tennis courts, children's counselors. Saddle horses extra. Golf nearby. Write for color folder, Averill 4, Vermont.

INFORMAL, FRIENDLY GUEST HOUSE halfway between Tanglewood and Jacob's Pillow. Superior food, lodging. Special weekly, monthly rates. Bossidy House, Lee, Massachusetts. 413-243-9775.

MAINE'S LAKES AND MOUNTAINS. Your private lakeside cottage with fireplace, in a beautiful American Plan resort. Color brochure and rates: The Barker, Rangeley Lakes, Maine.

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CANOE TRIPS OUTFITTED—everything furnished, $6.50 daily. Beautiful wilderness country. Free information: Border Lakes, Drawer 569, Ely, Minnesota.

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VACATIONS

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CRESTMONT INN—95 Lake Drive, Eagles Mere, Pennsylvania. Complete family resort. Tennis, golf (par 3, 18-hole regular), swimming (heated pool, lake), theater. Tot, teen programs. Rooms, cottages. Fine food. Moderate rates. June 17th-September 19th. Folder.

VACATION at The Cliff house & Motels. Quiet, informal. No hay fever. Dining Room. Cocktails. Heated pool. Golf. Ocean fishing. May 27th to October 9th. Ogunquit 5, Maine.

VACATION WORKSHOPS

THIS SUMMER Go Painting in Blue Ridge Mountains. Excellent food. Top instruction drawing, painting by George Solonevich, internationally known. Classes never larger than 12 with two instructors. Brochure: Blue Ridge Art Studio, Route 7, Roanoke, Virginia.

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PARIS AMERICAN ACADEMY OF MUSIC. Summer in France, July 1st to August 9th. For information: 25 rue Saint Didier, Paris 16, France.

"EUROPE TODAY." Combined tour/summer school for students 16 to 18. Tutorial, discussion, lectures, concerts, theaters, sightseeing, etc. Particulars from John Paine, M.A., Noble and Greenough School, Dedham, Massachusetts.

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KINGSLEY DOUBLE-CROSTIC NO. 1674

Reg. U. S. Patent Office

By Doris Nash Wortman

DEFINITIONS	WORDS
A. Mark which softens the letter C.	41 91 21 58 136 185 13
B. Probability.	45 68 107 22 90 128 38 143 99 103
C. Pleasing in manner or aspect.	127 32 78 155 101 111 159 15 164
D. Familiar category comprised of those having no regular work.	65 118 160 187 144 134 44 5 96 76
E. Pulpit or lectern (esp. in U.S.)	8 186 24 67
F. Act of developing a new coat of hair, feathers, etc.	132 18 77 9 82 56 70
G. Obtained at a sacrifice.	6 139 105 100 29 98
H. (To travel) without regard to obstacles; (treat) cavalierly.	4 39 157 80 154 129 131 137 169
I. A work of creation, esp. in music.	25 89 113 162
J. One thing *Don John of Austria rides homeward with* (G. K. Chesterton).	40 126 75 183 153 62
K. Reticulated.	71 63 179 37 130 52
L. Plural pronoun, equally useful as an adjective.	102 12 177 110 73
M. Genus of the hognose snake.	182 146 61 148 104 88 50 83 47
N. Fanatic; one possessed by an evil spirit.	170 92 27 14 174 178 158 19 147

DEFINITIONS	WORDS
O. Businessman who takes unreasonable advantage of a public or national need.	86 114 59 181 165 122 175 1 43
P. Repurchase; make amends for.	53 87 95 20 49 26
Q. Greatly delighted.	108 2 151 161 64 173 117 93 171
R. Specifying the law of certain inheritances observed in breeding experiments (stated by Austrian abbot, 19th cent.)	17 94 166 152 72 145 119 42 31
S. Increase abnormally, imprudently.	33 11 140 133 135 112 16
T. Apparent.	81 46 35 84 10 66 120
U. One thing Van Wyck Brooks tells us Mark Twain's wife would do for his writings as well as for him.	168 23 30 138
V. Put off; submit respectfully to the opinion or wishes of another.	150 54 34 3 184
W. What Edward Young said will happen to our wishes *as our sun declines.*	55 48 106 57 28 121 167 124
X. Robot.	123 79 172 7 163 116 176 180 60
Y. Gave additional impulse or stimulus to either actually or figuratively.	156 142 51 115 36 85 74
Z. Hang down; trust.	125 149 141 69 109 97

DIRECTIONS

To solve this puzzle you must guess twenty-odd WORDS, the definitions of which are given in the column headed DEFINITIONS. Alongside each definition, there is a row of dashes—one for each letter in the required word. When you have guessed a word, write it on the dashes, and also write each letter in the correspondingly numbered square of the puzzle diagram . . . When the squares are all filled in, you will find that you have completed a quotation from some published work. If read up and down, the letters in the diagram have no meaning . . . Black squares indicate ends of words; if there is no black square at the right side of the diagram, the word carries over to the next line . . . When all the WORDS are filled in, their initial letters spell the name of the author and the title of the piece from which the quotation has been taken. Of great help to the solver are this acrostic feature and the relative shapes of words in the diagram as they develop. Authority for spellings and definitions is Webster's New International Dictionary, Second and Third Editions.

					1 O	2 Q	3 V	4 H	5 D	6 G	7 X	8 E	9 F		10 T	11 S			
	12 L	13 A	14 N	15 C	16 S	17 R		18 F	19 N	20 P	21 A	22 B	23 U		24 E	25 I			
26 P	27 N	28 W	29 G	30 U	31 R	32 C		33 S		34 V	35 T	36 Y	37 K		38 B	39 H			
40 J		41 A	42 R	43 O	44 D	45 B	46 T		47 M	48 W	49 P	50 M	51 Y	52 K		53 P			
54 V	55 W	56 F	57 W	58 A	59 O	60 X		61 M	62 J	63 K		64 Q	65 D	66 T	67 E	68 B			
69 Z	70 F		71 K	72 R	73 L	74 Y	75 J	76 D		77 F	78 C	79 X	80 H	81 T		82 F			
83 M	84 T	85 Y		86 O	87 P	88 M	89 I	90 B	91 A		92 N	93 Q	94 R	95 P	96 D	97 Z			
	98 G	99 B		100 G	101 C	102 L		103 B	104 M	105 G	106 W	107 B		108 Q	109 Z				
110 L	111 C	112 S	113 I	114 O	115 Y	116 X	117 Q		118 D	119 R	120 T	121 W	122 O		123 X	124 W			
125 Z		126 J	127 C	128 B	129 H	130 K		131 H	132 F	133 S	134 D		135 S		136 A	137 H			
138 U		139 G	140 S		141 Z	142 Y	143 B	144 D	145 R	146 M		147 N	148 M	149 Z	150 V	151 Q			
152 R		153 J	154 H	155 C		156 Y	157 H	158 N	159 C	160 D	161 Q	162 I		163 X	164 C				
165 O		166 R	167 W	168 U	169 H	170 N	171 Q		172 X	173 Q		174 N	175 O	176 X		177 L			
178 N	179 K		180 X	181 O		182 M	183 J	184 V	185 A	186 E	187 D								

Solution of last week's Double-Crostic will be found on page 20 of this issue.

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Peggy's Cove needs painting.

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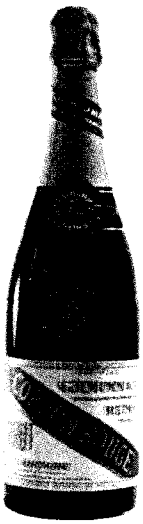

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